GRADED LESSONS IN ARITHMETIC

BY

W. F. Nichols

BOOK IV.

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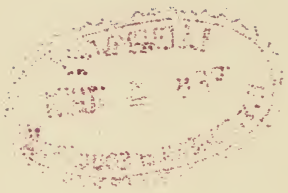

GRADED LESSONS

IN

ARITHMETIC

BOOK IV.

BY

WILBUR F. NICHOLS, A.M.

PRINCIPAL HAMILTON STREET SCHOOL, HOLYOKE, MASS.

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GENERAL INTRODUCTION.

1. These lessons have been prepared in the belief that it is a mistake to assume that one topic is to be finished before another is begun. The elements of many topics are here given in lower grades in explanations, illustrations, and examples easily understood by the younger pupils; and then the work in each topic is made more and more difficult through the various grades until it is finished. These examples have stood the test of the school-room, and in no case have they been found too difficult.

2. The arrangement of the topics is such that pupils in passing into a new grade find but few new topics, and many pupils are prepared for promotion from grade to grade at various times during the year, and are not obliged to wait for the annual promotions.

3. Such practical subjects as Percentage and Interest are introduced in the lower grades, where many pupils are found who are obliged to leave school before they reach the more advanced grades.

4. Clear conceptions of geometric forms and mensuration are introduced at an early period, that principles thus developed may be applied to many practical problems.

5. One or more lessons are given to the developing of a new topic; then the following lessons are so arranged as to give the pupils practice in applying the new topic in

connection with all the other topics previously learned. This constant review will be found very beneficial.

6. Few teachers will find the need of supplementary work, as so large a number of problems are given. On the other hand, few pupils should be required to solve all the problems. It is a good way to assign for required work for all the class that number of examples which even the slowest child can do, and then allow any child to work the remaining examples of the lesson as optional work.

7. The large amount of oral or mental examples will be appreciated by those who believe that ten minutes each day should be given to work of this kind. These are not mental gymnastics, but plain, practical, every-day questions.

8. The introduction of Algebra and Geometry in the higher grades will be found beneficial.

9. The methods here advocated are the shorter methods found in daily use among bankers, mechanics, and merchants.

The author desires to express his acknowledgments for many valuable suggestions to Mr. C. H. Morss, Superintendent of Schools of Medford, Mass.

WILBUR F. NICHOLS.

HOLYOKE, *September*, 1897.

INTRODUCTION TO BOOK IV.

This book contains a review of the principles taught in Book III., with their extension to problems of greater difficulty. A few new principles are introduced from time to time, the aim being to introduce the new thought side by side with the review of those already taught.

Realizing that the highest function of arithmetic is to develop thought power, our aim has been to accomplish this by many concrete examples suited to the child mind. To quicken the thought power we have found it useful frequently to give only statements of certain problems, leaving the pupils to determine first, *what* can be found, and then *how* to find it.

TABLES OF WEIGHTS AND MEASURES

FOR REFERENCE.

LINEAR MEASURE.

12 inches (in.)	= 1 foot (ft.).	$5\frac{1}{2}$ yards, or $16\frac{1}{2}$ feet	= 1 rod (rd.).
3 feet	= 1 yard (yd.).	320 rods, or 5280 feet	= 1 mile (m.).

SQUARE MEASURE.

144 square inches (sq. in.)	= 1 square foot (sq. ft.).
9 square feet	= 1 square yard (sq. yd.).
$30\frac{1}{4}$ square yards, or $272\frac{1}{4}$ square feet	= 1 square rod (sq. rd.).
160 square rods	= 1 acre (a.).
640 acres	= 1 square mile (sq. m.).

SOLID OR CUBIC MEASURE.

1728 cubic inches (cu. in.)	= 1 cubic foot (cu. ft.).
27 cubic feet	= 1 cubic yard (cu. yd.).

WOOD MEASURE.

16 cubic feet	= 1 cord foot (cd. ft.).
8 cord feet, or 128 cubic feet	= 1 cord (cd.).

LIQUID MEASURE.

4 gills (gi.)	= 1 pint (pt.).
2 pints	= 1 quart (qt.).
4 quarts	= 1 gallon (gal.).
1 gal.	= 231 cubic inches.

DRY MEASURE.

2 pints (pt.)	= 1 quart (qt.).
8 quarts	= 1 peck (pk.).
4 pecks	= 1 bushel (bush.).
1 bushel	= 2150.42 cubic inches.

AVOIRDUPOIS WEIGHT.

16 ounces (oz.)	= 1 pound (lb.).
2000 pounds	= 1 ton (t.).
2240 pounds	= 1 long ton

CIRCULAR MEASURE.

60 seconds (″)	= 1 minute (′).
60 minutes	= 1 degree (°).
360 degrees	= 1 circumference (circ.).

MISCELLANEOUS TABLE.

12 units	= 1 dozen.
12 dozen	= 1 gross.
12 gross	= 1 great gross.
20 units	= 1 score.
24 sheets	= 1 quire.
20 quires	= 1 ream.

TIME MEASURE.

60 seconds (sec.)	= 1 minute (m.).
60 minutes	= 1 hour (h.).
24 hours	= 1 day (d.).
7 days	= 1 week (wk.).
365 days	= 1 common year (c. yr.).
366 days	= 1 leap year (l. yr.).
100 years	= 1 century (C.).

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GRADED LESSONS IN ARITHMETIC.

BOOK IV.

LESSON 1.

NOTE. — In simplifying expressions that are connected by the signs plus and minus, perform the operations in the order in which the signs occur; or add all the quantities having a plus sign, then all quantities having a minus sign, and find the difference of these sums.

1. Simplify: $486 - 194 + 245 - 89 + 587 - 283 + 785$.
2. Simplify: $469 + 276 - 384 - 174 + 791 - 463 + 274$.
3. Simplify: $563 - 284 + 569 - 478 + 632 - 518 + 494$.
4. Simplify: $194 + 118 + 963 - 76 - 264 - 718 + 511$.
5. Simplify: $216 - 98 + 426 + 431 - 215 - 196 + 210$.
6. Find the cost of 434 sheep at $6 a head.
7. A farmer raised 634 bushels of potatoes, and sold 378 bushels. How many bushels had he left?
8. Add: 268, 723, 432, 785, 47, 496, 9, 780, 21, 947, 435.
9. A has 264 sheep, and B has 7 times as many. How many sheep have both?
10. If a farmer received $279 for 6 cows, what was the average price a cow?
11. If a man divides some money among his 6 children, giving each one $436, how much money does he divide?
12. How much must a grocer pay for 754 chests of tea at $8 a chest?
13. How many marbles have 7 boys, if each boy has 95 marbles?

ORAL.

1. Give all the odd numbers from 1 to 25.

2. Give all the even numbers from 2 to 24.

3. Give 5 numbers that are divisible (can be exactly divided) by 3.

4. Give 5 numbers that are divisible by 4.

5. Give 5 numbers that are *not* divisible by 3.

6. Give 5 numbers that are *not* divisible by 4.

7. How many quarts of vinegar at 5¢ a pint can be bought for $1?

8. George paid 45 cents for marbles. If he received 9 marbles for every 5 cents, how many marbles did he receive?

9. If you buy a dozen oranges at 60¢ a dozen, how much does each cost?

10. If $\frac{1}{2}$ pound of yarn costs 50 cents, how much will $2\frac{1}{2}$ pounds cost?

11. If your brother works $\frac{3}{4}$ of a day one week, and three half days the next week, how many days does he work during the 2 weeks?

12. How much money should you receive for 36 eggs at the rate of 25 cents a dozen?

13. Jennie had 36 cherries. She gave $\frac{1}{3}$ of them to her little brother, $\frac{1}{4}$ of them to her little sister, and ate $\frac{1}{3}$ of those she had left. How many did she keep?

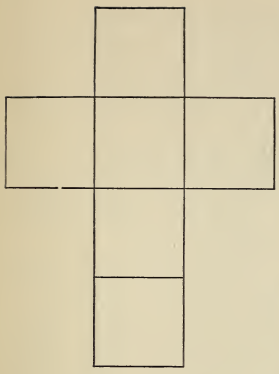
14. A little boy who lives beside a brook catches all the musk-rats he can find. If he catches 4 every month, except the winter months, how many does he catch in a year?

15. How much will $3\frac{1}{2}$ qt. of milk cost, if 1 pint is worth 3 cents?

16. What must I pay for 16 eggs at 12¢ a dozen?

17. 8 eggs are what part of a dozen? and what will they cost at 24¢ a dozen?

18. What will 2 doz. pears cost at 2¢ each?



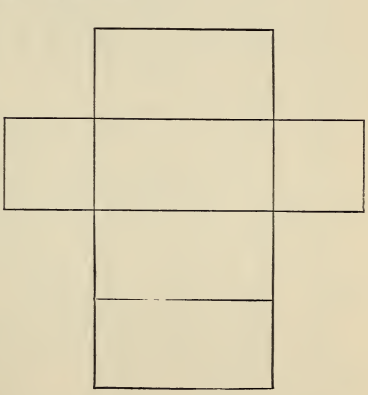
This illustration is drawn to a scale $\frac{1}{4}$. Cut this form out of paper of the proper size, and fold on the lines.

1. What form have you?
2. How many sides has your cube?
3. How many squares in the figure?
4. Of what then is each square of the figure an illustration?
5. What is the area of the entire surface of your 2-inch cube?
6. Show how you find the area of the surface of the cube by means of the figure at the top of the page.

Find the entire surface of the following cubes, and make an illustration for each:

7. A 3-inch cube. Scale $\frac{1}{2}$.
8. A 4-inch cube. Scale $\frac{1}{4}$.
9. A 2-foot cube. Scale 1 in. to a foot.
10. A 4-foot cube. Scale $\frac{1}{2}$ in. to a foot.

This illustration is to show the entire surface of a rectangular block or prism, 4 in. long, 2 in. wide, and 2 in. thick. Scale $\frac{1}{4}$.



Find the entire surface of the following, making illustrations:

11. A prism, 6 in. by 4 in. by 4 in. Scale $\frac{1}{2}$.
12. A prism, 8 in. by 6 in. by 6 in. Scale $\frac{1}{2}$.
13. A prism, 6 in. by 3 in. by 2 in. Scale $\frac{1}{4}$.
14. A prism, 5 in. by 5 in. by 3 in. Scale $\frac{1}{2}$.

ORAL.

1. In 1 bu. 2 pk., how many pecks?

2. What part of a minute is 30 seconds?

3. 9 is $\frac{1}{3}$ of how many?

4. 9 is $33\frac{1}{3}\%$ of how many?

5. \$12 is $\frac{1}{2}$ of my money; how much money have I?

6. \$12 is 50% of my money; how much money have I?

7. Jennie missed 6 words out of 30; what part did she miss?

8. What per cent of her words did Jennie miss?

9. I had \$500, but spent 20% of it; how much had I left?

10. How many sheets of paper are there in 10 quires?

11. Robert has \$2. One-half of his money is in dimes. How many dimes has he? If the rest is in quarters, how many quarters has he?

12. At 2 for 3 cents, what will 10 oranges cost?

13. What is the perimeter of a rectangle 4 in. wide and twice as long?

14. What is the area of this rectangle?

15. Find the entire surface of a 3-inch cube.

16. Find the perimeter of a rectangle $2\frac{1}{2}$ in. long and $1\frac{1}{2}$ in. wide.

17. What will $2\frac{1}{2}$ lb. of rice cost at $8¢$ a pound?

18. $\frac{1}{2} = \frac{}{10} = \frac{}{16} = \frac{}{20} = \frac{}{24}$.

19. A rectangular granite block is 5 ft. long, 2 ft. thick, and 3 ft. wide. How many cubic feet does it contain?

20. $\frac{1}{2}$ of 18 is $\frac{1}{6}$ of what number?

21. Of a flock of 20 sheep, $\frac{1}{5}$ are black, and the rest are white. How many are white?

22. Rewrite this example, using per cent instead of $\frac{1}{5}$.

23. What is the side of a square that contains 4 sq. in.? 16 sq. in.?

24. Draw a square a foot long. How many inches is it round the square?

1. Express in figures one hundred.
2. Express in figures nine hundred.
3. Express in figures ten hundred
4. Ten hundred is called one thousand.
5. How many ciphers are used to express one thousand? How many places do you need to write one thousand?
6. In the number 4657, what does 7 stand for? 5? 6? 4?

Express the following numbers in figures:

7. Seven thousand, two hundred sixty.
8. Four thousand, one hundred two.
9. One thousand, one hundred, one.
10. Two thousand, sixty-six.
11. Nine thousand, nine hundred, ninety-nine.
12. Eight thousand, one hundred, forty-one.
13. Five thousand, twenty-one.
14. Six thousand, four hundred, fifty-nine.
15. 6 hundreds, 2 tens, 5 units.
16. 9 thousands, 5 hundreds, 4 tens, 2 units.
17. 4 thousands, 4 hundreds, 5 units.
18. 9 thousands, 3 hundreds, 2 tens, 4 units.
19. Two thousand seven.
20. Eight thousand, three hundred, five.
21. Four thousand, nine hundred six.
22. Six thousand, three hundred twenty-five
23. Seven thousand, four hundred sixteen.
24. Eight thousand, ninety-six.
25. Three thousand, one hundred four.
26. Five thousand, seven hundred eleven.
27. Read the following numbers:

7421	5604	2960	4785	3175
2694	4057	1409	3470	8704
1001	6740	1056	2607	5691
2005	5070	2409	3560	4002

ORAL.

1. If 44 cents are paid for 11 oranges, what is the cost of an orange?

2. If 1 lamp is worth $5, how many lamps of the same kind are worth $45?

3. A pint of cream costs me 15 cents. If I buy a pint a day, how much does my cream cost me for one week?

4. A box is 7 in. long and 5 in. wide. How long must a string be to reach round it?

5. How many quarts will fill a 2-gallon jug?

6. How many quart bottles can be filled from 24 pints of ink?

7. In 2 years there are —— months.

8. In 11 weeks there are —— school days.

9. A tailor bought 5 yd. of cloth for $16. What was the cost of a yard?

10. Complete:

$$\frac{2)\quad}{8} \qquad \frac{2)\quad}{4} \qquad \frac{3)\quad}{6} \qquad \frac{5)\quad}{8} \qquad \frac{7)\quad}{5}$$

11. How many hours in $\frac{1}{3}$ of a day? In $\frac{2}{3}$ of a day?

12. I paid 56 cents for 7 lb. of raisins. What was the price a pound?

13. What is the cost of 8 lb. of oatmeal at 5¢ a pound?

14. If 1 man can do a piece of work in 35 days, in how many days can 5 men do the same work?

15. What is the cost of a cow, if $\frac{1}{4}$ of the price is $8?

16. If a cow is worth $32, and a calf 25% as much, how much is the calf worth?

17. How many books are worth $36, if 1 book is worth $6?

18. If a boy earns $5 a week, in how many weeks can he earn $35?

19. Seven and what number equals 13?

20. Six is seven less than what number?

21. At $6 a ton, what will 9 tons of coal cost?

SUBTRACTION.

Subtraction is the process of finding the difference between two numbers of the same kind.

The greater number is called the Minuend.

The less number is called the Subtrahend.

The result is called the Difference, or Remainder.

1.	4769	2387	4653	6431	6473
	3574	1628	2819	2674	2748
2.	6743	4564	3782	5436	5692
	4576	2684	2175	3265	2897
3.	4638	2897	3637	4648	7843
	2784	1695	2846	3639	4567
4.	9741	8765	7654	6543	6785
	7968	6574	4374	4638	4328
5.	7689	9876	8765	4321	5763
	4785	7928	4386	3761	4854
6.	7060	4301	5640	7002	3674
	6548	3619	4076	5609	2745
7.	4362	2794	4631	5148	3764
	3689	1876	3574	4863	2675
8.	7692	6478	3207	4046	7892
	5487	4364	1790	3707	5465
9.	4070	2067	1709	9999	7321
	3765	1754	687	4768	6574

ORAL.

1. If 3 bunches of grapes cost 8¢, what will 9 bunches cost?

2. If 5 lamps cost $4, what will 40 lamps cost?

3. If 7 primers cost $1.00, what will 28 primers cost?

4. 9 is $\frac{3}{5}$ of what number?

5. 12 is $\frac{4}{6}$ of what number?

6. 14 is $\frac{7}{8}$ of what number?

7. 6 is $\frac{2}{3}$ of what number?

8. 10 is $\frac{5}{8}$ of what number?

9. How much will 9 pigs cost, if 27 pigs cost $36?

10. What will 5 books cost, if 20 books cost $24?

11. 4 is what part of 8?

12. Alice had 27 roses, and gave $\frac{1}{3}$ of them to Edna, and $\frac{1}{3}$ to Kate. How many had she left?

13. What numbers multiplied together will produce 45? 27? 36? 24? 49?

14. If 1 ton of hay costs $8, what will $\frac{3}{4}$ of a ton cost?

15. If $\frac{3}{4}$ of a ton of hay costs $6, what will 1 ton cost?

16. How many fourths in $4\frac{1}{4}$? $2\frac{3}{4}$?

17. How many sixths in $2\frac{1}{6}$? $4\frac{3}{6}$?

18. How many ninths in $2\frac{2}{9}$? $3\frac{4}{9}$?

19. If 7 peaches cost 9 cents, what will 21 peaches cost at the same rate?

20. A sheep cost $5, which is $\frac{1}{6}$ the cost of a cow. What was the cost of the cow?

21. Think of a number, multiply it by 8, divide by 4, multiply by 3, divide by 6, add 20, subtract the number thought of, divide by 4, and name the result.

22. If $\frac{3}{5}$ of a yard cost $6, what will 1 yd. cost?

23. If $\frac{3}{7}$ of a yard of cloth cost $6, what will 1 yard cost?

24. If $\frac{3}{5}$ of a pound of rice cost 6 cents, what will 5 pounds cost?

1. Copy and learn: —

320 rods make 1 mile.

2. Write the table for Linear Measure.

3. How many rods are there in 7 miles? 5 miles? 9 miles?

4. How many feet are there in 725 yards? In 674 yards?

5. Measure the length and width in rods of the schoolhouse lot. How many square rods are there in it?

6. Draw a map of the schoolhouse lot, and place the schoolhouse on it. Scale 1 inch to a rod.

7. Yesterday there were 376 pupils present in school, and 128 absent. How many pupils belong to the school?

8. How many quarts are there in 68 gallons?

9. How many quarts are there in 164 pints?

10. Add: \$487.31, \$78.12, \$51.57, \$4.36, \$0.67, \$25.34, \$106.83, \$57.50, \$3.87.

11. Add: Three dollars and fifty cents, eighteen dollars and twenty-three cents, twenty-four dollars and two cents, six dollars and eight cents, twenty-five cents, four cents.

12. Multiply:

	By 9.		By 7.		By 5.		By 8.
a.	1076	*a.*	276	*a.*	2667	*a.*	2452
b.	2004	*b.*	1045	*b.*	1079	*b.*	3563
c.	1105	*c.*	2706	*c.*	2307	*c.*	1704
d.	4674	*d.*	3043	*d.*	1486	*d.*	2476
e.	5089	*e.*	4078	*e.*	2454	*e.*	1046

13. Add:

2763	3693	4567	2176	7892
3854	4937	5678	4935	5465
6472	5486	6789	5864	7321
7987	8768	7896	3489	6574
8698	7879	8957	1797	5334
4549	6554	9434	7548	8287

ORAL.

1. What will 5 bbl. of flour cost at $6 a barrel?

2. What part of 7 yards is 5 yards?

3. When coal is $6 a ton, what part of a ton will $3 buy?

4. If you can buy a gallon of vinegar for 15 cents, what part can you buy for 3 cents?

5. If you divide 16 peaches equally among 4 children, what part and how many will each receive?

6. When land is $20 an acre, what part of an acre can you buy for $5?

7. When peaches are selling at the rate of 5 for 8 cents, how many will 56 cents buy?

8. What number is that, which, if divided by 3 times 4, the quotient will be 8?

9. How many cows at $50 each can a man buy for $300?

10. How many 2-cent postage stamps can you obtain for 40 cents?

11. A boy had 20 marbles and lost 25% of them. How many did he lose?

12. 12 times 6 are how many times 8?

13. After buying 7 balls, George had 5 cents left. If he had 40 cents at first, how much did he pay for each ball?

14. A rectangle is 6 in. long, and contains 24 square inches. How wide is it?

15. A rectangle contains 32 square inches, and is 4 in. wide. How long is it?

16. What is the perimeter of a 5-inch equilateral triangle?

17. Fill blanks:

$\frac{1}{2}$ yr. ____ mo.	$\frac{1}{2}$ bu. ____ qt.	28 da. ____ wk.
8 qt. ____ pk.	3 yd. ____ ft.	16 pk. ____ bu.

18. How many inches in $\frac{1}{3}$ and $\frac{1}{4}$ of a foot?

19. A boy sold a knife for 75 cents, and gained 17 cents. How much did the knife cost him?

Multiplication, when the multiplier has two figures, tens and units.

Multiplication is a short way of adding equal numbers. The multiplicand is one of the equal numbers to be added. The multiplier is the number which shows how many equal numbers are to be added. The product is the result of the multiplication.

1. Multiply 43 by 24.

$$\begin{array}{r} 43 \\ 24 \\ \hline 172 \\ 860 \\ \hline 1032 \end{array}$$

The multiplier consists of 20 and 4. We multiply by 4, and obtain the partial product 172. Then 20 times 3 units are 60 units, which equals 6 tens and 0 units. 20 times 4 tens are 80 tens, and 6 tens are 86 tens, which equals 6 tens and 8 hundreds. The two partial products added give 1032. After the work is thoroughly understood, omit the final cipher in the second partial product.

Multiply:

2.	43	39	23	76	68	47	87	38
	32	74	67	26	62	54	96	89
3.	58	46	36	58	83	64	73	32
	76	58	78	36	47	27	19	91
4.	73	94	74	85	28	82	75	89
	81	46	64	53	39	93	83	67
5.	32	76	54	71	34	56	67	64
	84	23	58	89	96	64	45	53
6.	36	42	27	62	25	52	87	74
	47	73	32	24	48	73	98	65
7.	52	36	42	26	63	37	73	75
	93	37	74	86	65	73	79	53

ORAL.

1. Three-thirds of an apple equal how many apples?

2. Eight-fourths of an apple equal how many apples?

3. How many pieces of velvet, each half a yard long, can be cut from a piece $9\frac{1}{2}$ yd. long?

4. Make an example to illustrate how to find the entire cost, when the cost of several articles is given.

5. How many cents in $\frac{1}{4}$ of a dollar?

6. What is the difference between $\frac{4}{5}$ and $\frac{3}{5}$? $\frac{1}{2}$ and $\frac{1}{4}$?

7. How many fifths are there in 2? 3? 4? 5? 6?

8. If I lend you a $2 bill, and you pay me in half-dollars, how many must you give me?

9. Find the cost of 3 bu. of oats at $\frac{1}{3}$ of a dollar a bushel.

10. If $\frac{1}{2}$ doz. eggs cost 15 cents, what will 1 doz. cost? What will $\frac{1}{3}$ doz. cost?

11. What is the value of 7 sheep at $9 a head?

12. What is the value of 12 sheep at $7 a head?

13. Find the cost of 12 pencils at 4¢ each.

14. What is the cost of a bushel of potatoes at 30¢ a peck?

15. What is $\frac{2}{3}$ of 24? 36? 27?

16. A man pays $3 a month for his room-rent and $9 a month for his office-rent; how much rent does he pay a year?

17. If 12 boxes of oranges cost $72, what will 1 box cost? 9 boxes?

18. If 12 yd. of ribbon cost 96 cents, what will $\frac{1}{3}$ as many yards cost?

19. Divide 24 into 2 equal parts.

20. Divide 16 into 4 equal parts.

21. What number must you multiply by 7 to get 84?

22. If a train goes 40 miles an hour, how many miles will it go in 15 minutes?

23. What do I receive for an article that cost me 60 cents, and which I sell at a loss of 15 cents?

1. Add: \$6.84, \$47.76, \$96, \$4.85, \$46, \$9.73, \$75.

2. Multiply 4240 by 70.

3. Add: 6273, 7348, 4859, 5926, 8769, 3452, 8437.

4. At 8¢ a quart, what will 32 gal. of vinegar cost?

5. A farmer put his corn into 9 bins, putting 534 bu. into each bin. How many bushels of corn did he have?

6. Find the area of a piece of ground 219 yards long, and $\frac{1}{3}$ as many yards wide.

7. Multiply 478 by 28.

8. Divide 4764 by 4.

9. At \$6 an acre, how many acres of land can be bought for \$3456?

10. Find the number of square inches in a piece of cloth, 6 ft. long, and 9 in wide.

11. I sold land for \$4670, which was \$575 less than I paid for it. What did it cost me?

12. A farmer raised 135 bu. of potatoes in each of 24 fields. How many bushels did he raise?

13. How many half-inch squares are there in a rectangular sheet of paper 10 in. wide and 8 in. long?

14. If 1 acre of land costs \$9, how many acres can you buy for \$6570?

15. What will 786 lb. of sugar cost at 6¢ a pound?

16. What number added to 2176 will give 5124?

17. Simplify: $596 + 378 + 216 - 432 - 674 + 963 - 459 - 76$.

18. A man bought a house and lot for \$3475, and sold it for \$4350. How much did he gain?

19.	2764	2706	3896	4896	5643
	4	5	6	7	4
20.	6745	1974	5742	9808	1746
	8	9	3	2	6

ORAL.

1. What change ought you to receive from a quarter-dollar, after paying for 6 oranges at 3¢ each?

2. $\frac{1}{8}$ of 64 is ——? 9 is $\frac{1}{8}$ of ——?

3. Find the cost of 7 pails at 12¢ each?

4. How many feet in 96 inches?

5. The sides of a triangle measure 8 in., 9 in., and 7 in. respectively. Find the distance round it.

6. If my brother lives 17 years longer, he will be 35 years old. How old was he 5 years ago?

7. 18 is the product of what two numbers? Of what other two numbers?

8. How much farther is it round a 5-inch square than round a 2-inch square?

9. What change shall I receive from $1 for purchases amounting to:

¢	¢	¢	¢	¢	¢	¢	¢	¢	¢
45	37	68	72	44	35	11	95	87	31
76	28	37	75	55	22	16	9	80	33
43	94	68	27	66	30	60	90	70	20
82	86	91	32	77	34	41	61	46	36
65	15	14	48	88	72	89	92	17	99

10. Find the cost of 1 pair of gloves at 20 cents, and 1 yd. of ribbon at 17 cents.

11. Find the cost of 4 lb. of sugar at 5¢ a pound, and 2 lb. of rice at 5¢ a pound.

12. A boy was carrying 60 eggs to market, but broke $\frac{1}{2}$ of them. How many did he break?

13. How many would he have broken if he had broken 50% of them? 25%?

14. What must you pay for 15 postal cards and 10 2-cent stamps?

TO MULTIPLY A FRACTION BY AN INTEGER.

1. If I asked you to multiply 2 books by 4, would you try to multiply the name books, or would you multiply the 2, which tells the number of books?

2. If I should ask you to multiply 2 thirds by 4, should you multiply the name thirds? What should you do?

3. 4 times 2 books = 8 books.
4 times 2 thirds = 8 thirds.

4. Multiply $\frac{3}{4}$ by 4. 4 times 3 fourths are 12 fourths, which equal 3 units.

5. Multiply: $\frac{6}{9}$ by 3. $\frac{5}{8}$ by 4. $1\frac{5}{12}$ by 6. $\frac{5}{6}$ by 4.
$\frac{2}{3}$ by 9. $1\frac{3}{14}$ by 7. $1\frac{8}{15}$ by 5. $\frac{7}{8}$ by 4.

6. Multiply: $1\frac{5}{18}$ by 9. $\frac{3}{25}$ by 5. $1\frac{12}{72}$ by 12. $\frac{2}{3}$ by 6.
$\frac{7}{8}$ by 12. $\frac{3}{8}$ by 4. $1\frac{4}{14}$ by 7. $\frac{9}{11}$ by 22.

7. Multiply: $\frac{1}{9}$ by 3. $\frac{1}{8}$ by 6. $1\frac{1}{12}$ by 9. $\frac{4}{5}$ by 10.
$\frac{3}{7}$ by 5. $\frac{5}{6}$ by 3. $1\frac{3}{12}$ by 6. $\frac{3}{4}$ by 8.

2 $\frac{1}{2} \times 6 = \frac{6}{2} = 3$.
$\frac{6}{12}$
$\frac{3}{15}$

NOTE. — Do not change mixed numbers to fractional forms in the following examples. 6 times 2 units are 12 units. 6 times $\frac{1}{2}$ are $\frac{6}{2}$, which are 3 units. 12 units and 3 units are 15 units.

8. Multiply: $2\frac{1}{3}$ by 6. $8\frac{1}{3}$ by 6. $9\frac{1}{2}$ by 4. $4\frac{1}{3}$ by 9.
$4\frac{3}{12}$ by 8. $4\frac{2}{5}$ by 5. $7\frac{3}{12}$ by 8. $2\frac{2}{5}$ by 5.

9. Multiply: $8\frac{3}{5}$ by 5. $3\frac{1}{2}$ by 8. $4\frac{1}{3}$ by 9. $5\frac{1}{4}$ by 8.
$8\frac{2}{3}$ by 9. $6\frac{3}{4}$ by 8. $4\frac{4}{5}$ by 10. $3\frac{4}{7}$ by 14.

10. Multiply: $6\frac{2}{3}$ by 9. $4\frac{5}{8}$ by 9. $15\frac{1}{5}$ by 9. $5\frac{2}{3}$ by 12.
$8\frac{1}{3}$ by 9. $7\frac{1}{3}$ by 6. $24\frac{1}{4}$ by 8. $8\frac{7}{8}$ by 16.

11. Multiply: $3\frac{2}{5}$ by 5. $7\frac{4}{5}$ by 5. $8\frac{1}{6}$ by 12. $8\frac{1}{7}$ by 14.
$4\frac{1}{2}$ by 8. $9\frac{3}{4}$ by 8. $6\frac{5}{8}$ by 8. $4\frac{7}{9}$ by 18.

12. Multiply: $7\frac{4}{9}$ by 9. $8\frac{3}{5}$ by 3. $8\frac{5}{6}$ by 12. $4\frac{5}{7}$ by 14.
$8\frac{3}{4}$ by 12. $6\frac{5}{8}$ by 16. $7\frac{7}{8}$ by 8. $8\frac{5}{9}$ by 3.
$12\frac{5}{6}$ by 3. $8\frac{6}{7}$ by 7. $12\frac{3}{4}$ by 16. $9\frac{1}{2}$ by 12.

13. Formulate a rule for multiplying a fraction by an integer.

ORAL.

1. 21 is 14 more than what number?

2. A watch cost $20, and a chain cost $7. How much more did the watch cost than the chain?

3. A hotel keeper bought 24 boxes of strawberries of 1 man and 6 boxes of another. $\frac{1}{3}$ of the whole was used for breakfast. How many boxes were used for breakfast?

4. Grace spent 5 cents for a watch key, and had 27 cents left. How much had she at first?

5. Alice paid 28 cents for some paper, $\frac{1}{4}$ as much for pencils, and $\frac{1}{7}$ as much for a penholder. How many cents did she spend?

6. Harry sold his sled for 68 cents. This was 8 cents more than it cost him. How much did it cost him?

7. John sold his knife to Charles for 20 cents. This was 5 cents less than he paid for it. What did it cost John?

8. Make problems for the following:

4×8	$4\frac{1}{8} \times 8$	$32 \div 4$	$35 \div 7$
$3 \times 10\frac{1}{3}$	3×11	$33 \div 11$	$8 \times 4\frac{1}{4}$
$4 \times 7\frac{1}{4}$	$6 \times 5\frac{1}{6}$	$\frac{1}{11}$ of 33	$\frac{1}{7}$ of 35
2×16	$8\frac{1}{4} \times 4$	$\frac{1}{4}$ of 32	$4 \times 8\frac{1}{2}$

9. 3 is what part of 36? 9 is what part of 36?

10. If $9 is $\frac{1}{4}$ of my money, how much money have I?

11. At $5 each, how many writing-desks can be bought for $37?

12. Mary had 40 cents. She spent $\frac{1}{4}$ of it for paper, $\frac{1}{4}$ of it for a thimble, and $\frac{1}{4}$ of it for some ribbon. How many fourths had she left? How many cents had she left?

13. $\frac{1}{2}$ a yard is how many inches? $\frac{1}{4}$ of a yard? $\frac{1}{8}$ of a yard?

14. Estimate the length and width and height of 5 objects in the room, and then measure them.

15. Do the same to 5 objects out of the room.

16. What is $\frac{1}{4}$ of 36?

17. How many quarts in $\frac{1}{2}$ a bushel?

	A	B	C	D	E
f.	97.41	94.68	71.78	98.22	48.18
g.	14.66	46.87	77.17	29.82	57.34
h.	87.35	59.89	32.62	37.67	64.17
i.	24.19	78.93	26.23	57.17	56.11
j.	46.05	14.64	37.91	82.82	82.98
k.	36.71	46.42	48.78	28.24	44.36
l.	78.11	45.89	47.82	91.14	58.47
m.	92.45	85.98	75.14	13.31	11.47
n.	95.36	23.37	21.51	94.19	44.64
o.	53.67	35.73	12.42	66.42	32.93

1– 5. Add each column.

6–15. Add each line.

16–20. Add from *f* to *j* in each column.

21–25. Add from *g* to *k* in each column.

26–30. Add from *h* to *l* in each column.

31–35. Add from *i* to *m* in each column.

36–40. Add from *j* to *n* in each column.

41–45. Add from *k* to *o* in each column.

46–50. Add *f* and *g*, and from the sum subtract *h* in each column.

51–55. Add *g* and *h*, and from the sum subtract *i* in each column.

56–60. Add *h* and *i*, and from the sum subtract *j* in each column.

61–65. Add *i* and *j*, and from the sum subtract *k* in each column.

66–70. Add *j* and *k*, and from the sum subtract *l* in each column.

71–75. Add *k* and *l*, and from the sum subtract *m* in each column.

76–80. Add *l* and *m*, and from the sum subtract *n* in each column.

ORAL.

1. $\frac{1}{6} + \frac{1}{4} = ?$ $\frac{1}{2} + \frac{1}{6} = ?$ $\frac{1}{3} + \frac{1}{12} = ?$ $\frac{2}{6} + \frac{1}{3} = ?$
$\frac{1}{2} + \frac{1}{3} = ?$ $\frac{1}{3} + \frac{1}{4} = ?$ $\frac{1}{2} + \frac{1}{4} = ?$ $\frac{1}{3} + \frac{1}{6} = ?$

2. Half a bushel of berries is how many quarts?

3. 2 bushels of potatoes are how many pecks?

4. A farmer has 24 acres of land. $\frac{1}{8}$ is planted with potatoes, $\frac{1}{6}$ with corn, $\frac{1}{12}$ with oats, the rest to pasture land. How many acres each are there of potatoes, corn, oats, and pasture?

5. A man bought a horse for $85. He paid $10 in money, and gave his watch for the rest. How much was his watch worth?

6. 25 cents are what part of a dollar? $\frac{1}{4}$ of a dollar is how many cents?

7. What is 25% of $16?

8. What is $33\frac{1}{3}$% of $30?

9. What is $66\frac{2}{3}$% of $90?

10. If a lamp is bought for $5 and sold at 20% profit, what will be the gain and selling price?

11. How many cents in two dollars and ninety-four cents?

12. How many dollars in six hundred forty-two cents?

13. If $\frac{1}{4}$ of a yard of ribbon costs 2 cents, how many yards can you buy for 32 cents?

14. How many yards is it round a rectangular rug 6 ft. long and 3 ft. wide?

15. George earns $6 a month selling papers, and John earns $\frac{1}{3}$ as much; how much do both boys earn in a month? How much in 6 months?

16. Jennie had 11 quarts of nuts, and sold 8 pints. How many quarts had she left?

17. A grocer has 7 gal. 2 qt. of kerosene. How long will it last him if he sells a quart a day?

18. James has 9 cents; John 3 times as many less 6. How many has John?

LONG DIVISION.

Division is the process of finding how many times one number is contained in another; or of finding one of the equal parts of a number.

The dividend is the number to be divided.

The divisor is the number by which we divide.

The quotient is the number of times the dividend contains the divisor.

```
 126
6)756
 6
 15
 12
 36
 36
```

Write the numbers as in short division. 6 is contained in 700, 1 hundred times. Write the 1 above the 7 instead of below it, as we shall use the space below. Once 6 is 6; write it below the 7 and subtract. Our remainder is 1 hundred, or ten tens, which with the 5 tens makes 15 tens. 6 in 15 tens, 2 tens times, which is written above in the column of tens. 6 times 2 tens are 12 tens. Place this below the 15 tens and subtract. Our remainder is 3 tens or 30 units, and 6 units more make 36 units. 6 is contained in 36 units 6 units times. Place the 6 units above in the column of units. 6 times 6 units are 36 units, which subtracted from 36 units leaves no remainder.

NOTE. — There will be no trouble in teaching Long Division if care is taken to lead the pupils to see that by this way all the work is expressed on paper, and that is the reason why it is longer for such examples as the illustration. If they ask why we use a long way for doing examples, let them see that short ways are sometimes too difficult.

Avoid the expression "bring down the 5, etc," as we do nothing of the kind.

1.	8)792	9)819	3)4272	4)4256	6)3642
2.	7)6307	8)7264	9)6489	9)5481	7)6517
3.	7)2268	8)2936	8)3384	9)2097	9)2925
4.	7)2565	6)1479	8)7577	9)6328	8)6735

ORAL.

1. John solved 18 problems before school and 6 problems in school. How many problems did he solve?

2. Begin with 4, and count to 53 by 7's.

3. A garden contains 19 pear trees and 7 peach trees. How many trees in the garden?

4. Frank gave 12 cents for pencils, 5 cents for a rubber, and 6 cents for paper. How much did all cost?

5. A lady paid $27 for a shawl, $8 for a bonnet, and $3 for a pair of shoes. How much did she pay for all?

6. A boy paid 45 cents for a ball, 8 cents for marbles, and 7 cents for an orange. How much did he pay in all?

7. Charles's lesson consists of 15 examples, and he has solved all but 4 of them. How many has he solved?

8. Jennie is 16 years old, and her sister is 9 years younger. How old is her sister?

9. A man gave $15 for a saddle, and $6 for a bridle. How much did both cost? How much more did the saddle cost than the bridle?

10. Begin with 44, and count backwards by 4's.

11. Begin with 63, and count backwards by 7's.

12. From a cask containing 45 gal. of molasses, 39 gal. were sold. How many gallons remain unsold?

13. If a man earns $45 a month and spends $36, how much does he save?

14. Subtract by 4's from 70 back to 2.

15. Subtract by 6's from 87 back to 3.

16. Subtract by 9's from 86 back to 5.

17. Subtract by 7's from 66 back to 3.

18. Luther paid 20 cents for 4 bananas. How much was that for one?

19. 20 pounds of butter will last a family 5 weeks. How much butter do they use a week?

LONG DIVISION. DIVISOR TWO FIGURES.

```
  36
20 ) 720
  600
  120
  120
```

20 is contained in 72 tens 3 tens times. Place the 3 tens above the tens figure. 20 times 3 tens are 60 tens, which subtracted from 72 tens leaves 12 tens. 12 tens equal 120 units. 20 is contained in 120 units 6 units times. 20 times 6 units are 120 units, which subtracted from 120 units leaves no remainder.

1. Divide 26220 by 20.
2. Divide 49260 by 20.
3. Divide 45760 by 20.
4. Divide 36390 by 30.
5. Divide 98640 by 40.
6. Divide 57600 by 50.
7. Divide 678420 by 20.
8. Divide 7896870 by 70.
9. Divide 4568970 by 80.
10. Divide 69872840 by 40.
11. Divide 1728 by 36.

```
  48
36 ) 1728
  144
  288
  288
```

30 is contained in 172 tens how many tens times? 30 times 5 tens are how many? Take 150 from 172, how many are left? 6 times 5 tens are how many? Can 30 tens be taken from 22 tens? Does this prove that 36 is contained in 172 only 4 times? After determining the quotient figure 4 the explanation is the same as above. Perform this same work for yourself in determining the units figure of the quotient.

12. Divide 2448 by 51.
13. Divide 4392 by 61.
14. Divide 3969 by 81.
15. Divide 1323 by 21.
16. Divide 1323 by 21.
17. Divide 1764 by 21.
18. Divide 2976 by 31.
19. Divide 3075 by 41.
20. Divide 3264 by 51.
21. Divide 4758 by 61.
22. Divide 1848 by 21.
23. Divide 4459 by 91.
24. Divide 3038 by 31.
25. Divide 4615 by 71.
26. Divide 6237 by 81.
27. Divide 2928 by 61.
28. Divide 5187 by 91.
29. Divide 2079 by 21.
30. Divide 2583 by 41.
31. Divide 2697 by 31.
32. Divide 3654 by 87.
33. Divide 47102 by 18.
34. Divide 468096 by 46.
35. Divide 340111 by 67.

ORAL.

1. Fred had 50 marbles, and Edward had 25. If Fred should buy $\frac{2}{5}$ of Edward's marbles, how many would each have then?

2. Jerry earns $53 a month. If he spends $20 and pays $5 a week for his board, how much money does he save in a month?

3. Peter sold his knife so as to gain 9 cents; if this was $\frac{1}{6}$ of what he paid for it, how much did he pay for it? For how much did he sell it?

4. A merchant packed 5 doz. hats in boxes. If he put 6 hats in each box, how many boxes did it take?

5. If my watch loses 5 min. a day, how many hours will it lose in 1 week and 5 days?

6. Lucy is $4\frac{1}{2}$ yr. old, and her cousin Harry is twice as old. How old is he?

7. George worked 3 days and earned 6 cents a day. He gave his sister 3 cents, and spent $\frac{1}{3}$ of what was left. How much had he then?

8. Nellie had 9 plums. If she ate $33\frac{1}{3}\%$ of them, and gave away 50% of what was left, how many did she have then?

9. What is 10% of 60? 25% of 84? $33\frac{1}{3}\%$ of 90? 20% of 100?

10. If out of a gallon of vinegar I use a pint a day, how much shall I have at the end of 4 days?

11. I bought a dozen eggs at a cent and a half each. I used 5 and sold the rest at 2¢ each. How much more did I pay out than I received?

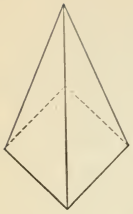
12. A man bought a watch for $37, but found he had only $24 with him. How much more does he need to pay for the watch?

13. A watch cost $40. For how much must it be sold to gain $13?

14. What will 3 lb. of sugar cost at 8¢ a pound?

15. Find the cost of 11 lb. of ginger at 12¢ a pound.

1. Divide 2622 by 23.
2. Divide 4925 by 25.
3. Divide 5760 by 24.
4. Divide 3240 by 72.
5. Divide 1960 by 56.
6. Divide 5941 by 29.
7. Divide 2944 by 64.
8. Divide 7055 by 83.
9. Divide 8568 by 56.
10. Divide 2932 by 64.
11. Divide 5460 by 26.
12. Divide 5092 by 76.
13. Divide 6330 by 33.
14. Divide 2307 by 72.
15. Divide 3788 by 15.
16. Divide 7884 by 54.
17. Divide 1288 by 42.
18. Divide 4950 by 32.
19. Divide 7674 by 91.
20. Divide 4742 by 23.
21. Divide 2627 by 87.
22. Divide 1474 by 34.
23. Divide 1560 by 24.
24. Divide 4645 by 32.
25. Divide 3496 by 75.
26. Divide 7891 by 44.
27. Divide 3942 by 85.
28. Divide 9876 by 56.
29. Divide 6847 by 65.
30. Divide 7831 by 76.
31. Divide 3481 by 83.
32. Divide 5766 by 74.
33. Divide 8763 by 82.
34. Divide 7563 by 81.
35. Divide 2345 by 55.
36. Divide 4642 by 63.
37. Divide 8976 by 92.
38. Divide 5964 by 82.
39. Divide 9846 by 91.
40. Divide 6741 by 73.
41. Divide 7896 by 21.
42. Divide 19885 by 41.
43. Divide 11408 by 31.
44. Divide 9744 by 21.
45. Divide 228191 by 31.
46. Divide 23868 by 51.
47. Divide 45445 by 61.
48. Divide 366212 by 41.
49. Divide 53136 by 81.
50. Divide 39767 by 91.
51. Divide 48426 by 21.
52. Divide 48351 by 71.
53. Divide 46008 by 81.
54. Divide 14916 by 22.
55. Divide 14656 by 32.
56. Divide 35448 by 42.
57. Divide 72009 by 81.
58. Divide 37392 by 82.
59. Divide 420484 by 62.
60. Divide 10994 by 23.
61. Divide 18791 by 43.
62. Divide 209576 by 68.
63. Divide 60466 by 49.
64. Divide 195548 by 76.
65. Divide 28404 by 54.
66. Divide 379061 by 83.



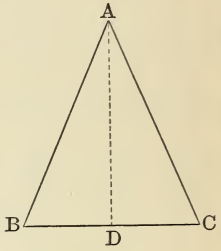
NOTE. — A square pyramid should be in the teacher's hand for illustration.

1. Can you tell the name of what I hold in my hand?

2. Why is it called a *square* pyramid?

3. As this pyramid stands on my hand, can you see this line running from the middle of the base to the vertex?

4. Is it a vertical line? What kind of a line is it? *Ans.* Slanting or oblique line.



5. Look at this figure. Does AB measure the height of the triangle ABC? What line does measure the height of the triangle?

6. Does this slanting line on the pyramid measure the real height of the pyramid?

7. Where must we measure to get the real height of the pyramid?

8. What name can we give to this slanting line? *Ans.* Slant height.

9. Now look at one face of the pyramid? What shape is this face?

10. What line is the altitude of the isosceles triangle?

11. Point to the slant height. How many faces has the pyramid? Each face is what? Point to the altitude of each face.

12. How do you find the area of an isosceles triangle? The base is 10 in., the altitude 8 in. What is the area?

13. To find the surface of this pyramid you must find the area of how many isosceles triangles, and of what other figure?

14. Let us measure this pyramid. The base is 4 in. and the slant height 9 in. How many square inches in one face? How many in the 4 faces? How many in the base? How many in the whole pyramid?

Fig. 1.

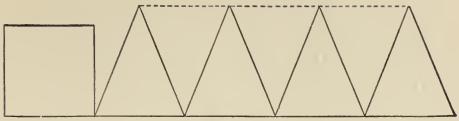


Fig. 2.

1. Look at Fig. 2. That is the way we illustrate the base and four sides of a pyramid. We connect the tops with a dotted line to show that when in position they would touch.

Find the entire surface of the following square pyramids and illustrate each, using $\frac{1}{4}$ in. to represent an inch or a foot according to the dimensions given:

2. Base 6 in., slant height 10 in.
3. Base 8 in., slant height 12 in.
4. Base 10 in., slant height 14 in.
5. Base 7 in., slant height 12 in.
6. Base 9 in., slant height 12 in.
7. Base 11 in., slant height 14 in.
8. Base 15 in., slant height 20 in.
9. Base 24 in., slant height 36 in.
10. Base 20 ft., slant height 42 ft.
11. Base 12 in., slant height 18 in.
12. Base 13 in., slant height 16 in.
13. Base 14 in., slant height 20 in.
14. Base 12 in., slant height 36 in.
15. Base 18 in., slant height 40 in.
16. Base 16 in., slant height 36 in.
17. Base 15 in., slant height 18 in.
18. Base 11 in., slant height 16 in.
19. Base 20 in., slant height 30 in.
20. Base 24 in., slant height 40 in.
21. The perimeter of the square base is 32 ft., and the slant height 16 ft. Find the entire surface.

ORAL.

1. 12 is 25% of what number?
2. 9 is 25% of what number?
3. 40 is what per cent of 40?
4. 2 is what per cent of 2?
5. 5 is what per cent of 20?
6. 4 is what per cent of 20?
7. 9 is 50 % of what number?
8. 8 is 10% of what number?
9. 6 is what per cent of 24?
10. If I use 18 sheets from a quire of paper, what part of the whole do I use? What per cent of the whole do I use?
11. 18 is what per cent of 24?
12. If you have 20 cents, and spend 10 cents, what part of your money do you spend? What per cent of it do you spend?
13. 10 is what per cent of 20?
14. 25% of \$80 is how many dollars?
15. I have a box containing 15 bunches of envelopes. If I use $33\frac{1}{3}\%$ of them, how many bunches do I use?
16. If you had 20 examples to do for your number lesson, and did 100% of them correctly, how many did you do?
17. A basket of wood, which weighed 50 lb., stood out in the rain. When wet it was found to have gained 20% in weight. How much did it weigh then?
18. If you paid 12 cents for a dozen apples, for how much must you sell them to gain 50%?
19. Grace spent 5 cents this morning, which was 25% of all the money she had. How much money had she?
20. 5 is 25% of what number? 50% of what number?
21. 6 is $33\frac{1}{3}\%$ of what number? 20% of what number?
22. A man bought a cart for \$20, and sold it at a loss of 25%. What did he get for the cart?
23. If a horse cost \$80, at what price must it be sold to gain 10%.

1. Add:

$$\begin{array}{r} 1\frac{1}{4} + 2\frac{1}{4} + 2\frac{3}{4} + 1\frac{1}{4} + 2\frac{1}{4} + 3\frac{3}{4} \\ 2 + 3\frac{1}{4} + 3 + 2\frac{3}{4} + 2\frac{1}{4} + 2\frac{3}{4} \\ \underline{8\frac{1}{4} + 4\frac{1}{4} + 4\frac{1}{4} + 5 + 2\frac{2}{4} + 4\frac{3}{4}} \end{array}$$

2. Subtract:

$26\frac{1}{4}$	$24\frac{1}{4}$	12	$43\frac{1}{3}$	$15\frac{3}{4}$	30
$13\frac{1}{4}$	12	$8\frac{1}{4}$	$30\frac{1}{3}$	$12\frac{1}{4}$	$28\frac{3}{4}$

3. Add:

$$\begin{array}{r} \$27.05 + \$12.09 + \$9.16 + \$11.23 + \$18.19 = ? \\ 16.15 + 6.11 + 16.31 + 8.71 + 7.30 = ? \\ 4.23 + 14.36 + 14.55 + 13.48 + 6.16 = ? \\ 17.11 + 18.42 + 6.34 + 17.61 + 11.17 = ? \\ \underline{19.26 + 16.78 + 34.64 + 11.34 + 8.96 = ?} \end{array}$$

4. Divide:

344 by 14	4500 by 15	4745 by 38	1735 by 35
403 by 13	2775 by 25	2147 by 19	5814 by 19
360 by 15	2636 by 16	1196 by 23	4211 by 42

5. Multiply:

648 by 26	478 by 67	763 by 36	436 by 46
364 by 19	563 by 89	814 by 36	438 by 29
478 by 78	413 by 48	927 by 64	748 by 67
689 by 84	732 by 17	378 by 58	549 by 74

6.	7.	8.	9.
6427	2265	9697	8363
7484	9727	6562	8888
3297	2965	7684	8322
1634	8587	5795	2646
7426	4978	6857	3181
6758	9265	4832	2349
5473	8422	6237	7663
8384	9296	5527	8362
7684	9433	2386	8297

ORAL.

1. If you divide 25 cents into 5 equal parts, what is the value of each part?

2. Find:

$\frac{3}{4}$ of 48	$\frac{2}{3}$ of 45	$\frac{8}{11}$ of 44	$\frac{4}{11}$ of 121
$\frac{5}{6}$ of 30	$\frac{6}{7}$ of 42	$\frac{6}{7}$ of 56	$\frac{3}{4}$ of 400
$\frac{3}{7}$ of 28	$\frac{9}{10}$ of 70	$\frac{2}{5}$ of 45	$\frac{5}{6}$ of 600
$\frac{7}{9}$ of 72	$\frac{8}{12}$ of 24	$\frac{3}{8}$ of 24	$\frac{6}{7}$ of 49
$\frac{2}{3}$ of 24	$\frac{4}{9}$ of 27	$\frac{2}{3}$ of 33	$\frac{9}{12}$ of 72

3. How many chains at \$3 each can I buy for \$21?

4. At \$7 a week, how many weeks can I board for \$63?

5. What will $\frac{1}{4}$ of a pound of chocolates cost at 36¢ a pound?

6. What will $\frac{1}{2}$ of a pound of pepper cost at 18¢ a pound?

7. Find the cost of 17 eggs at 12¢ a dozen?

NOTE. — Since each removal of a figure one order to the left multiplies its value by 10, the annexing of one cipher to any number multiplies that number by 10; the annexing of two ciphers multiplies it by 100.

8. How many are:

10×23?	10×16?	$\frac{1}{10}$ of 230?	$\frac{1}{10}$ of 160?
10×36?	10×72?	$\frac{1}{10}$ of 450?	$\frac{1}{10}$ of 720?
10×45?	10×88?	$\frac{1}{10}$ of 360?	$\frac{1}{10}$ of 880?
10×32?	10×91?	$\frac{1}{10}$ of 320?	$\frac{1}{10}$ of 910?

9. Multiply:

18 by 10	5 by 100	8 by 10	8 by 100
27 by 10	25 by 100	12 by 10	12 by 100
63 by 10	32 by 100	16 by 10	16 by 100
95 by 10	76 by 100	20 by 10	20 by 100

10. Divide:

760 by 10	800 by 100	6500 by 100	80 by 10
890 by 10	1600 by 100	8800 by 100	200 by 10
420 by 10	2400 by 100	400 by 100	1000 by 10

11. Three girls have together 35 cents; the first has 13 cents, and the other two have just the same number. How many have they?

1. Into how many parts is this square divided?

2. One strip is what part of the whole square?

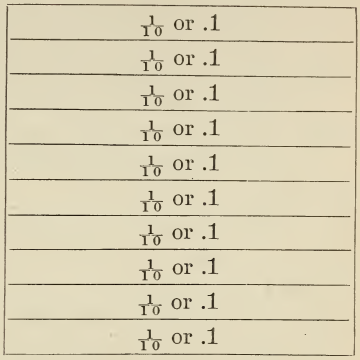
3. In how many different ways is one-tenth written in the illustration?

4. When written in this form, .1, it is called a decimal fraction, and the period is called the decimal point.

5. Two strips are what part of the whole square?

6. Write it in two ways.

7. How many tenths does it take to make a unit?



8. In the number 412.3, what is the figure at the left of the 2 units called? At the right?

9. Why are these figures so called? *Ans.* The figure at the left of units is called tens, because it takes 10 units to make 1 of that place. The figure at the right of units is called tenths, because it takes 10 of them to make a unit, so that 1 of them must be $\frac{1}{10}$ of a unit.

10. Add:

2 books	$2	$\frac{2}{10}$	.2
3 books	$3	$\frac{3}{10}$	.3
4 books	$4	$\frac{4}{10}$	.4

11. How many units are there in 30 tenths?

12. How many units and tenths are there in 25 tenths? Write it decimally.

13. Add: 7.6, 7.8, 5.7, 8.2, 3.4.

14. Add: 9.8, 5.9, 6.5, 9.6, 6.3, 5.7, 5.6.

15. Read 205.6. In reading we say two hundred five *and* six tenths. Notice the decimal point is read as *and*, and this word should be used in reading numbers only to indicate a decimal.

ORAL.

1. Reduce to whole or mixed numbers : $\frac{16}{4}$, $\frac{13}{3}$, $\frac{25}{6}$, $\frac{79}{9}$, $\frac{87}{11}$.

2. Reduce to improper fractions : $5\frac{2}{3}$, $12\frac{3}{5}$, $4\frac{5}{6}$, $3\frac{3}{4}$, $6\frac{1}{2}$.

3. What is $\frac{1}{4}$ of 20? 36? 48? 56? 72?

4. What is $\frac{1}{3}$ of 21? 27? 30? 36? 48?

5. What is $\frac{1}{5}$ of 15? 30? 40? 45? 60?

6. If 6 cords of wood cost $48, what is the price a cord?

7. How many oranges can I buy for 48 cents, at the rate of 8¢ each?

8. How many oranges at 4¢ each can be bought for 8 lemons worth 5¢ each?

9. How many are 15 plus 5, divided by 5?

10. How many are 18 plus 6, divided by 6?

11. How many are 40 plus 8, divided by 8?

12. How many are 35 plus 7, divided by 7?

13. At 80¢ each, how much will 9 arithmetics cost?

14. Mason earned $15 a week, and paid $7 for his board? How much could he save in 8 weeks?

15. If 6 men can do a piece of work in 20 days, how long will it take 1 man to do it?

16. In an orchard there are 16 rows of trees, and 10 trees in each row. How many trees are there in the orchard?

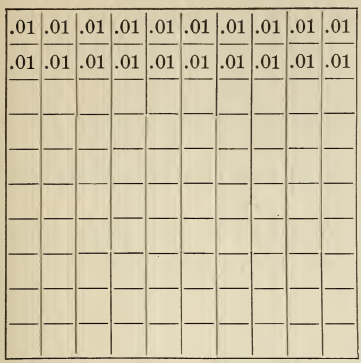
17. Arnold earned $18 a week, and paid $9 a week for his board. How much could he save in 8 weeks?

18. How many are 3 times 5, plus 6? 5 times 6, plus 7? 6 times 7, plus 8? 7 times 8, plus 9? 9 times 10, plus 11? 12 times 10, plus 10?

19. A boy paid 15 cents for $\frac{3}{4}$ of a pie. What was the price of the whole pie?

20. Three pecks is what part of a bushel? What per cent of a bushel?

21. A dozen bottles of ink are worth 60 cents. How many bottles can I buy for 45 cents?



1. How many strips are there in this square? How many little squares are there in each strip?

2. What part of the whole strip is each little square?

3. What part of the whole square is each little square?

4. In what two ways can you write one one-hundredth? $\frac{1}{100}$ or .01.

5. In the expression .01, the cipher means that there are no tenths of a unit, but 1 one-hundredth of a unit.

6. In the number, 125.36, what is the 5 called? 2 called? 3 called? 1 called? 6 called?

7. Tell why each of these figures is so called?

8. 7 small squares are what part of the large square? Write it in figures.

9. Write in figures what represents 4 strips; 4 squares; 2 strips; 6 squares; 3 strips, and 6 squares.

10. Show what part of the whole square is represented by .5; .21; .10; .07; .16; .02.

11. How many tenths and hundredths in .25? .42? .75? .86?

12. Tell how many units, tenths, and hundredths there are in the following: 1.15, 3.06, .07, 1.05, .75, 16.02.

13. Write in decimal form: $\frac{4}{10}$, $\frac{8}{10}$, $\frac{11}{100}$, $\frac{65}{100}$, $\frac{3}{100}$, $\frac{2}{100}$, $\frac{2}{10}$.

14. Read the following sums of money (1) as dollars and cents; (2) as dollars, dimes, and cents; (3) as dollars and tenths and hundredths of a dollar; (4) as dollars and decimals of a dollar: $5.25, $1.05, $10.08, $6.17, $5.25.

15. Express the following decimally: 8 tenths, 16 hundredths, 5 hundredths, 8 tenths, 15 hundredths.

1. How many feet in 12 yards? In 144 inches?

2. What is $\frac{1}{12}$ of 60 books? Of \$96? Of 72 cows?

3. Find the price of $\frac{1}{12}$ of 36 acres at \$11 an acre.

4. Arthur is 12 years old, and Perry is $33\frac{1}{3}\%$ as old. How old is he?

5. How many cords are $\frac{3}{11}$ of 121 cords? What will they cost at \$5 a cord?

6. How many dollars are $\frac{1}{11}$ of \$99? If you divide them among three persons, how many dollars will each receive?

7. 55 equals how many 11's?

8. $\frac{1}{11}$ of 33 equals what?

9. At \$10 a head, what will 11 cows cost?

10. 10 cents is what part of a dollar? What % of it?

11. 20 cents is what part of a dollar? What % of it?

12. 50 cents is what part of a dollar? What % of it?

13. What is $\frac{1}{3}$ of 36? 18? 72? 99? 81?

14. What is $\frac{1}{7}$ of 35? $\frac{2}{7}$? $\frac{3}{7}$? $\frac{4}{7}$? $\frac{5}{7}$? $\frac{6}{7}$? $\frac{7}{7}$?

15. A farmer had 12 bushels of oats, and 9 times as many bushels of corn. How many bushels of grain had he?

16. At 8¢ a peck, how much will 2 bushels of oats cost?

17. What is 1 qt. of beans worth, if a peck is worth 64 cents?

18. 63 are how many 9's?

19. 8 is what part of 72?

20. How many pecks in 32 qt.? 72 qt.? 56 qt.?

21. If a person walks 8 hours a day, how many hours will he walk in 6 days?

22. At \$12 a month, how much rent must a man pay in a year?

23. How many cubic inches are there in a box 6 in. long, 4 in. wide, and 2 in. deep?

24. $\frac{3}{4}$ of an hour are how many minutes?

25. 9 weeks are how many days?

26. If a boy has $4\frac{1}{2}$ doz. eggs, how many will he have left after selling 30 eggs?

1. Mr. Jackson paid $457.25 for a horse, $287.50 for a carriage, $56.75 for a harness, $12.35 for robes, and $1.75 for a whip.

2. Below are a dealer's sales for a week. Find the value of the sales for each day, and also the value of each kind of merchandise for the week.

	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.
Flour,	$175.25	$67.85	$246.29	$41.50	$116.11	$230.40
Sugar,	216.44	111.42	78.92	172.19	48.17	145.36
Tea,	98.17	6.45	15.45	8.39	9.11	75.45
Coffee,	79.71	11.46	9.78	12.15	16.45	26.32
Spices,	37.45	19.75	17.25	36.62	8.15	17.21

3. If your parlor is 18 feet long and 14 feet wide, and your sitting-room 16 ft. long and 12½ ft. wide, how many yards of picture moulding do you need for both rooms?

4. I owe a grocer $75. If I begin Monday and pay him $5 every day during the week, how much shall I owe him Saturday night?

5. My coal cost me $52.75 last year, and $4.25 for carrying it into the cellar. This year my coal was $47.36, and $6.37 for carrying it in. How much more did my coal cost me last year than this?

6. A doctor owes a grocer $287.83, and the grocer owes the doctor $175.28. If the doctor should pay the grocer $28.36, how would their accounts then stand?

7. I bought 623 books at $7 each.

8. A man bought 197 desks at $5 each.

9. When there are 42 gallons in a cask, how many casks will 966 gallons fill?

10. How many days are there in 3675 hours?

11. Add: 4.05, 16.16, 11.07, 8.5, 9.6.

12. Subtract:

10.05	11.16	6.11	8.08	9.21
6.34	7.05	4.73	6.36	7.48

ORAL.

1. $4 \times 7\frac{1}{2}$ $19 - 12\frac{1}{2}$ $42\frac{1}{2} - 11$ $68 + 17\frac{1}{2}$
$6 \times 5\frac{1}{2}$ $83\frac{1}{2} - 12$ $77\frac{1}{2} + 11\frac{1}{2}$ $84\frac{1}{2} - 7\frac{1}{2}$

2. At $\frac{1}{2}$ of a cent each, how many apples can I buy for 8 cents? 12 cents? 16 cents? 24 cents?

3. How many dozen marbles can I buy for 36 cents, at $\frac{1}{2}$ a cent each?

4. If 4 cents is $\frac{1}{2}$ of all the money you have, how much have you?

5. At 20¢ a peck, what will $6\frac{1}{2}$ pecks of apples cost?

6. How many fourths are there in $\frac{1}{2}$?

7. How much is two times $\frac{1}{4}$?

8. Two times $\frac{1}{4}$ are how many halves?

9. How much is 3 times $\frac{1}{4}$?

10. $\frac{3}{4}$ is how much larger than $\frac{1}{2}$?

11. $\frac{1}{4}$ in. + $\frac{1}{4}$ in. equals —— of an inch?

12. How many fourths in the following: 1? $1\frac{1}{4}$? $1\frac{1}{2}$? $1\frac{3}{4}$? 2? $2\frac{1}{2}$? $3\frac{1}{4}$? $4\frac{3}{4}$? $5\frac{1}{2}$? $8\frac{1}{4}$?

13. If each of the following numbers are $\frac{1}{4}$ of other numbers, what are those numbers: 8? 3? $1\frac{1}{2}$? $3\frac{3}{4}$? $2\frac{1}{4}$? $6\frac{1}{2}$? $7\frac{1}{4}$?

14. In $\frac{3}{4}$ of a peck there are how many quarts?

15. In $\frac{3}{4}$ of a bushel there are how many pecks?

16. $\frac{3}{4}$ of a foot and $\frac{1}{2}$ of a foot are how many feet? How many inches?

17. If $\frac{1}{2}$ a yard of cloth costs 6 cents, what will $2\frac{3}{4}$ yards cost?

18. $\frac{1}{4}$ is how many times $\frac{1}{8}$?

19. 2 times $\frac{3}{8}$ are how many fourths?

20. 4 times $\frac{1}{8}$ are how many halves?

21. What will 1 bu. of chestnuts cost at 10 cents a quart?

22. If a man walks 4 miles an hour for 5 hours a day, how many days will he take to walk 100 miles?

23. If 4 balls cost $1, how many dollars will 84 balls cost?

24. Paid $32 for 16 yards of cloth. What did it cost a yard?

TO MULTIPLY A DECIMAL BY AN INTEGER.

NOTE. — Be careful to place the decimal point in your product whenever you write tenths.

Multiply 1.7 by 4.

$$\begin{array}{r} 1.7 \\ \times\ 4 \\ \hline 6.8 \end{array}$$

4 times 7 tenths are 28 tenths, which equals 2 units and 8 tenths. Write the 8 tenths. What must you always place before tenths? Be sure then and write the decimal point before tenths. 4 times 1 unit are 4 units, and 2 units are 6 units. Write the 6 units. The explanation is similar when the multiplicand is hundredths.

Multiply:

1.	.08	.36	.18	.14	.34	.46
	4	6	4	8	7	6
2.	.38	.75	.06	.46	.51	.49
	5	9	8	3	6	7
3.	1.67	1.39	3.04	2.07	4.73	2.08
	5	8	4	7	3	6
4.	8.07	6.38	8.09	6.03	16.06	9.10
	9	3	7	6	7	5
5.	7.6	10.05	6.04	1.4	1.06	1.07
	7	4	7	9	7	8
6.	4.7	5.07	12.07	8.75	5.09	6.06
	6	7	6	7	8	8
7.	4.06	2.09	15.7	9.08	7.07	12.03
	9	9	8	8	7	7
8.	7.05	6.42	7.65	12.04	8.63	4.23
	6	6	5	5	4	4

ORAL.

1. If 8 lb. of meat cost 48 cents, what will 10 lb. of meat cost?

2. How much must be paid for 12 books at the rate of 5 books for 50 cents?

3. If $\frac{1}{6}$ of the price of a cow is \$5, what is the whole price of the cow?

4. What is the value of 9 bu. of potatoes at the rate of 3 dimes for $\frac{1}{3}$ of a bushel?

5. If $\frac{3}{4}$ of a pound of starch costs 9 cents, what will 1 pound cost?

6. How much will 6 bushels of apples cost, if $\frac{7}{8}$ of a bushel costs 70 cents?

7. 9 is $\frac{1}{3}$ of what number? 10 is $\frac{1}{4}$ of what number?

8. 40 is $\frac{1}{6}$ of what number? 50 is $\frac{5}{8}$ of what number?

9. A man sold a cow for \$24, which was $\frac{4}{5}$ of what he paid for her. What did she cost? What did he lose?

10. What are $\frac{5}{7}$ of 42? 63? 49? 84?

11. A watch cost \$10 more than $\frac{4}{5}$ of \$40. What was its cost?

12. Mary has $\frac{1}{3}$ of 30 roses, and Sarah $\frac{1}{2}$ of 20 roses. How many roses have they both?

13. What are $\frac{2}{3}$ of 9? 12? 15? 18?

14. What are $\frac{2}{3}$ of 24? 21? 30? 36?

15. How many inches in 9 feet and 6 inches?

16. How many feet in the length of each side of a square yard? How many square feet in a square yard?

17. How many gills in 6 pints? 8 pints? 3 quarts? 1 gallon?

18. How many pints in 5 quarts? 9 quarts? 1 peck? 1 bushel?

19. How many quarts in 3 pecks? 7 pecks? 3 bushels? 24 pints?

20. 3 and 6 are what parts of 12?

21. 7 and 3 are what parts of 21?

22. What is the relation of 7 to 42?

TO MULTIPLY A DECIMAL.

Multiply 3.14 by 24.

$$\begin{array}{r} 3.14 \\ 24 \\ \hline 12.56 \\ 62.8 \\ \hline 75.36 \end{array}$$

In this example the explanation for multiplying by 4 is the same as in Lesson 35. 2 tens are 20, so we say 20 times 4 hundredths are 80 hundredths, or 8 tenths, which is written under tenths. 20 times 1 tenth is 20 tenths, or 2 units, which is written under units. 20 times 3 units is 60 units or 6 tens, which is written under tens.

Multiply:

1.	6.09	8.07	6.38	7.63	8.78	4.23
	42	58	28	82	94	64
2.	8.70	8.00	6.38	3.07	1.67	5.99
	49	75	38	38	15	53
3.	.83	.75	.83	.73	.06	.47
	16	12	25	32	72	59
4.	1.75	9.36	2.10	4.07	9.16	8.37
	75	65	55	45	35	47
5.	10.06	12.46	11.09	5.25	7.16	7.49
	24	22	20	18	16	48
6.	54.97	68.28	95.56	21.83	16.68	42.85
	94	54	89	29	42	84
7.	79.47	83.74	35.99	42.36	87.61	36.55
	65	49	36	87	98	32
8.	49.72	65.87	84.63	42.54	22.92	89.76
	47	43	89	54	38	47

ORAL.

1. I spent $\frac{1}{2}$ of a dollar for a ball, and $\frac{1}{10}$ of a dollar for a bat. What part of a dollar did I spend for both?

2. If I sell $\frac{1}{6}$ of a dozen oranges to one person, and $\frac{1}{4}$ of a dozen to another person, what part of a dozen do I sell? How many oranges do I sell?

3. 18 hours is what part of a day? What per cent of a day?

4. $78 - 7 - 9 - 6 - 4 - 10 - 3 - 4 = ?$

5. $15 + 9 + 6 + 10 + 8 + 3 + 7 + 8 = ?$

6. How many inches are there in 1 yard? In 2 yards?

7. If 8 apples cost 32 cents, what must I pay for 11 apples?

8. To find the cost of articles at 25¢ a lb., yd., etc. At 25¢ each, 4 articles will cost \$1, hence the given number of articles will cost $\frac{1}{4}$ as many dollars as there are articles.

At a uniform price of 25¢ find the cost of:

32 balls.	56 vases.	60 bars of soap.
52 lb. of coffee.	48 straw hats.	44 bu. of tomatoes.
36 books.	84 yd. of ribbon.	40 yd. of cloth.

9. Since 50¢ is $\frac{1}{2}$ of a dollar, a number of articles at 50¢ each will cost $\frac{1}{2}$ as many dollars as there are articles.

At 50¢ each find the cost of:

44 lb. of tea.	59 books.	30 capes.
48 penknives.	68 pairs of scissors.	56 boxes of pens.
64 lb. of candy.	64 readers.	33 dolls.
76 grammars.	36 lamps.	48 chairs.

10. How many 9's in 3 times 21?

11. A half-dollar and a quarter-dollar equal —— cents?

12. What is the relation of 12 to 4? Of 15 to 5? Of 16 to 8? Of 18 to 6?

13. If 6 combs cost 9 cents, what will 12 combs cost?

14. Frank lost 12 marbles, which is $\frac{3}{5}$ of what he had at first. How many had he at first?

15. 10 is $\frac{5}{7}$ of what number?

1. A field, in the shape of a rectangle, is 275 yards long and 105 yards wide. How many yards of fence will it take to enclose it?

2. Multiply 983 by 56.

3. Divide 9575 by 25.

4. Find the cost of 12 coats at $18.75 each.

5. A farmer raised $57\frac{3}{4}$ bu. of wheat. He used $10\frac{1}{2}$ bu. for flour, and kept $8\frac{1}{2}$ bu. for seed. How many bushels were left?

6. A grocer sells $1\frac{1}{2}$ lb. of butter for 48 cents. How many half-pounds does he sell? How much is 1 half-pound worth? How much is one pound worth?

7. A storekeeper charges 75 cents for $\frac{3}{4}$ of a yard of silk. How much does he charge for each quarter of a yard? How much for 1 yard?

8. Add $14\frac{1}{8}$, $13\frac{1}{4}$, $12\frac{1}{2}$, and subtract their sum from $45\frac{7}{8}$.

9. From $70\frac{1}{4}$ take $56\frac{1}{8}$.

10. How many pints of milk in 24 gallons?

11. A farmer paid $1500 for 25 cows. What was the cost of a cow?

12. Paid 15 cents for a quart of molasses. What will 15 gallons cost at the same rate?

13. Add $27\frac{2}{9}$ and $20\frac{7}{9}$.

14. Divide 1554 by 42.

15. A girl bought 6 packages of sugar, each containing 3 pounds. If she paid 90¢ for all, how much did she pay for a package? How much for a pound?

16. A man had 120 sheep, and sold $\frac{1}{4}$ of the flock for $150. How much did he receive for each sheep?

17. A merchant's sales on Monday amounted to $56.25; Tuesday, $45.63; Wednesday, $67.50; Thursday, $65.87; Friday, $24.08, and Saturday, $75.

18. A newspaper has 9275 subscribers, 7090 of whom live in the city. How many live in the country?

ORAL.

To multiply decimals by 10, 100, etc.

$$\begin{array}{r} 2.4 \\ 10 \\ \hline 24.0 \end{array}$$

Ten times 4 tenths are 40 tenths, which equal 4 units and no tenths. Write 0 tenths. 10 times 2 units are 20 units, and 4 units are 24 units. Write the 24 units. Read your answer. Compare your answer with your multiplicand. What change has taken place in the position of the decimal point?

$$\begin{array}{r} 2.46 \\ 100 \\ \hline 246.00 \end{array}$$

The explanation here is the same as that above. Observe the change in the position of the point.

Multiply 3.2 by 10. Multiply 2.42 by 100.

In these examples do you observe the same change in the position of the decimal point?

Multiply:

1.	1.46	2.75	10.0	1.05	9.65	9.06
	10	10	10	10	10	10
2.	9.18	15.15	4.12	7.30	11.09	17.85
	10	10	10	10	10	10
3.	5.16	16.24	3.14	11.12	7.05	91.6
	10	10	10	10	10	10
4.	20.05	10.12	8.06	5.12	7.94	3.69
	100	100	100	100	100	100
5.	8.32	4.7	.16	1.2	1.4	23.7
	100	100	100	100	100	100
6.	75.00	10.0	.10	1.2	1.6	70.5
	100	100	100	100	100	100

Formulate a rule for multiplying a decimal by 10, 100, etc.

1. Paid for labor, $104, for boards, $530, for timber, $243, and for hardware, $112. How much was paid for all?

2. Find the difference between 389 and 581.

3. Multiply 763 by 37.

4. Divide 98763 by 21.

5. Change $\frac{3}{8}$ to 24ths.

6. Change $\frac{30}{75}$ to smallest terms.

7. Change $\frac{84}{9}$ to a mixed number.

8. Add $\frac{5}{6}$, $\frac{3}{4}$, and $1\frac{1}{2}$.

9. From $4\frac{1}{3}$ take $1\frac{7}{4}$.

10. Multiply 564 by 45.

11. In 2 yd. 2 ft. 2 in. how many inches?

12. Bought nuts for $2 a bushel, and sold them for 10 cents a quart. How much did I gain on 1 bushel? On 5 bushels?

13. If the top of your desk is 2 ft. long and 18 in. wide, how many yards is it round the desk? How many square feet are there in the top?

14. What is the area of the entire surface of a 4-foot cube?

15. What will 84 yd. of cloth cost at $66\frac{2}{3}$ cents a yard?

16. Express as common fractions: 10%, 25%, $33\frac{1}{3}$%, 50%.

17. What % of 24 is 6? Is 12? Is 18?

18. What per cent of 42 miles is 21 miles?

19. $6 is 20% of what number?

20. 40 rods is 25% of how many rods?

21. If $\frac{1}{2}$ oz. of tea costs 5 cents, what will 1 oz. cost? 1 lb.?

22. How many 4-inch squares can you get out of a square foot?

23. How many gills in 5 gallons?

24. How many gills in 2 gal. 3 qt.?

25. What is $\frac{1}{8}$ of 64? $\frac{1}{9}$ of 81? $\frac{1}{10}$ of 110? $\frac{1}{2}$ of 96?

26. $\frac{1}{3}$ of 21, $\frac{1}{4}$ of 32, and $\frac{1}{7}$ of 35, from 5 times 10 leaves how many times 6?

27. How many square feet of surface on the outside of a box 3 ft. long, 2 ft. wide, and 1 ft. high?

ORAL.

1. What part of a number is 25% of it?
2. What part of a number is 20% of it?
3. What part of a number is 10% of it?
4. What part of a number is $12\frac{1}{2}$% of it?
5. What part of a number is $33\frac{1}{3}$% of it?
6. What part of a number is 100% of it?
7. What is 10% of 120?
8. What is 50% of 140?
9. What is 25% of 80?
10. What per cent of 9 is 3? Of 12 is 4?
11. What per cent of a number is $\frac{1}{2}$ of it?
12. What per cent of a number is $\frac{3}{4}$ of it?
13. What per cent of a number is $\frac{2}{3}$ of it?
14. What per cent of a number is $\frac{1}{5}$ of it?
15. What per cent of a gallon is 2 quarts?
16. What per cent of a quart is 4 gills?
17. What per cent of a day is 12 hr.? 8 hr.? 6 hr.?
18. What per cent of a bushel is 16 qt.? 8 qt.?
19. What per cent of a yard is 2 ft.? 1 ft.? $1\frac{1}{2}$ ft.?
20. What per cent of a foot is 6 in.? 4 in.? 3 in.?
21. A man paid \$50 for a cow, and sold it at a loss of 10%. How much did he lose?
22. 40 is 25% of what number?
23. 25 is $33\frac{1}{3}$% of what number?
24. I bought a book case for \$15, and sold it for \$18. What per cent did I gain?
25. A man bought bananas at 20 cents a dozen, and sold them so as to gain 25%. What did he receive for a dozen?
26. What is the number of children in your room if 5 is 10% of the whole number?
27. 50 pupils belonged in a school. One stormy day 10 were absent. What per cent were absent?

1. A man owed \$1725; he paid \$150 at one time, \$275 at another, and \$390 at another. How much does he still owe?

2. Bought some flour for \$60, a ham for \$3, and a box of starch for \$2. What change should I receive for a \$100 bill?

3. If 5 men divide 640 acres of land equally, how many acres does each man get, and how much is each man's share worth at \$75 an acre?

4. What is the sum of $\frac{3}{5}$ and $\frac{5}{6}$?

5. If I had $\frac{7}{8}$ of a yard of ribbon, and have used $\frac{1}{2}$ of a yard, what part of a yard have I left?

6. Sold goods for \$20, and thus gained \$5. What did the goods cost? What per cent was gained?

7. John has \$300.25, and William \$175.15. How much more has John than William? How many dollars have both of them?

8. What will 75 bbl. of flour cost at \$6.25 a barrel?

9. What will a peck of chestnuts cost at $12\frac{1}{2}$¢ a quart?

10. How many gallons in 512 pints of oil? What will it cost at 30¢ a gallon?

11. Reduce 180 bushels to quarts?

12. What is $33\frac{1}{3}\%$ of 1200 sheep?

13. A man sold a horse for \$200 that had cost him \$150. How many dollars did he gain? What per cent did he gain?

14. What is the wall surface in a room whose sides are 12 ft. in length, 10 ft. in width, and 9 ft. in height?

15. Add:

$1\frac{3}{4}$	$2\frac{1}{4}$	$3\frac{1}{3}$	$2\frac{1}{4}$	$1\frac{1}{2}$
$2\frac{1}{2}$	$1\frac{5}{8}$	$4\frac{1}{2}$	$3\frac{3}{8}$	$6\frac{7}{8}$
$3\frac{3}{8}$	$4\frac{1}{2}$	$2\frac{5}{6}$	$7\frac{3}{4}$	$4\frac{1}{4}$

16. Multiply 10.60 by 100.

17. Multiply 1.05 by 25.

18. $5\frac{1}{2}$ lb. + $7\frac{1}{2}$ lb. − $3\frac{1}{2}$ lb. + $9\frac{1}{2}$ lb. − $11\frac{1}{2}$ lb. are how many pounds?

ORAL.

1. $\frac{1}{3} - \frac{1}{4} = ?$ $\frac{1}{2} - \frac{1}{5} = ?$ $\frac{3}{4} - \frac{1}{8} = ?$
$\frac{1}{4} - \frac{1}{6} = ?$ $\frac{1}{2} - \frac{1}{8} = ?$ $\frac{5}{6} - \frac{1}{2} = ?$

2. $\frac{1}{2} + \frac{1}{4} = ?$ $\frac{1}{2} + \frac{1}{3} = ?$ $\frac{1}{3} + \frac{1}{4} = ?$
$\frac{1}{2} + \frac{1}{6} = ?$ $\frac{1}{3} + \frac{1}{6} = ?$ $\frac{1}{2} + \frac{1}{8} = ?$

3. Change: $\frac{1}{2}$ to 6ths. $\frac{1}{4}$ to 8ths. $\frac{1}{5}$ to 20ths.
$\frac{1}{3}$ to 6ths. $\frac{1}{3}$ to 12ths. $\frac{1}{6}$ to 24ths.

4. Change to smallest terms:
$\frac{2}{4}$, $\frac{4}{6}$, $\frac{3}{6}$, $\frac{4}{8}$, $\frac{5}{10}$, $\frac{6}{10}$, $\frac{3}{12}$, $\frac{4}{12}$, $\frac{8}{12}$, $\frac{9}{12}$, $\frac{10}{12}$, $\frac{6}{12}$, $\frac{3}{9}$, $\frac{6}{9}$, $\frac{6}{8}$, $\frac{10}{15}$, $\frac{8}{16}$.

5. Change to improper fractions:
$2\frac{1}{2}$, $3\frac{2}{3}$, $4\frac{2}{5}$, $6\frac{5}{7}$, $4\frac{5}{9}$, $5\frac{4}{5}$, $7\frac{2}{3}$, $9\frac{5}{8}$, $7\frac{6}{9}$.

6. 4 is what part of 12? What per cent of it?

7. What is $\frac{2}{3}$ of 12? What is $66\frac{2}{3}\%$ of it?

8. 8 is $\frac{2}{3}$ of what number?

9. Having \$15, I spent \$10. What part of my money did I spend? What per cent of my money did I not spend?

10. A day is what part of a week?

11. What part of a pound is 8 oz.? What per cent is it?

12. What part of a bushel is 3 pk.? 8 qt.?

13. 10 is $\frac{2}{5}$ of what number? $\frac{5}{8}$?

14. 12 is $\frac{3}{4}$ of what number? $\frac{4}{5}$?

15. 15 is $\frac{5}{6}$ of what number? $\frac{3}{8}$?

16. I had a jointed fishing rod in 3 parts. One part was $2\frac{1}{2}$ ft. long, another $2\frac{3}{4}$, and another $3\frac{3}{4}$. How long was the rod?

17. \$56 is $\frac{7}{8}$ of my money. How much money have I?

18. In a school of 48 scholars $\frac{5}{8}$ are girls. How many boys are there?

19. If $\frac{1}{2}$ lb. of coffee costs \$.15, what will 2 lb. cost?

20. How many quarter-dollars in $\$4\frac{3}{4}$?

21. There were 72 bananas in a bunch. $33\frac{1}{3}\%$ of them were sold at one time, 25% of them at another, $12\frac{1}{2}\%$ at another. How many remained?

22. 3 is $12\frac{1}{2}\%$ of what number?

NOTE. — If the quotient is placed below the dividend or above, the decimal points come under each other as in addition or subtraction.

To divide a decimal fraction by a whole number, or to find a part of a decimal.

$3\overline{)4.65}$
1.55

3 is contained in 4 units 1 unit times, and 1 unit remaining. 1 unit is equal to 10 tenths, and 6 tenths make 16 tenths. 3 is contained in 16 tenths 5 tenths times and 1 tenth remaining. 1 tenth is equal to 10 hundredths and 5 hundredths make 15 hundredths. 3 is contained in 15 hundredths 5 hundredths times.

Divide:

1.	$4\overline{)4.48}$	$5\overline{)5.50}$	$2\overline{)4.06}$	$3\overline{)7.14}$	$5\overline{)13.95}$
2.	$5\overline{)7.10}$	$6\overline{)7.02}$	$8\overline{)10.64}$	$9\overline{)4.68}$	$6\overline{)96.06}$
3.	$7\overline{)46.06}$	$7\overline{)45.71}$	$6\overline{)10.08}$	$9\overline{)10.08}$	$7\overline{)18.76}$
4.	$8\overline{)9.04}$	$6\overline{)4.08}$	$7\overline{)78.96}$	$5\overline{)10.05}$	$8\overline{)916.8}$
5.	$4\overline{)46.08}$	$9\overline{)98.73}$	$6\overline{)70.02}$	$5\overline{)6.05}$	$7\overline{)23.45}$
6.	$7\overline{)80.71}$	$8\overline{)72.32}$	$9\overline{)39.51}$	$6\overline{)21.54}$	$7\overline{)41.86}$
7.	$7\overline{)290.5}$	$4\overline{)297.2}$	$6\overline{)245.4}$	$9\overline{)237.6}$	$7\overline{)765.8}$
8.	$8\overline{)76.88}$	$9\overline{)90.36}$	$8\overline{)96.72}$	$5\overline{)61.65}$	$7\overline{)32.34}$
9.	$7\overline{)42.35}$	$8\overline{)35.92}$	$8\overline{)83.44}$	$9\overline{)77.31}$	$5\overline{)78.05}$
10.	$6\overline{)746.4}$	$4\overline{)48.72}$	$9\overline{)74.52}$	$8\overline{)653.6}$	$7\overline{)863.1}$

ORAL.

1. A farmer having 80 sheep, lost 25% of them. How many sheep did he lose?

2. What is $33\frac{1}{3}\%$ of 60 bushels of corn?

3. What is 50% of 36 horses?

4. If I buy hats at \$5 each, and sell them at \$4 each, what part do I lose? What per cent do I lose?

5. Three-fourths of a number is what per cent of it?

6. 7 oranges are 25% of how many oranges?

7. James gave $\frac{1}{2}$ of a pear to William, $\frac{1}{3}$ to George, and kept the rest himself. How much did he give away? How much did he keep?

8. If 2 bbl. of apples are worth \$4, what are 8 bbl. worth?

9. What will 3 yd. of cloth cost if 8 yd. cost \$32?

10. Two men, A and B, are 21 miles apart. A travels 5 miles an hour, and B follows him, travelling 8 miles an hour. How many miles does B gain on A in one hour? In how many hours will B overtake A?

11. How many tables at \$9 each can be bought for \$63?

12. If 15 is 3 fourths of some number, what is 1 fourth of the same?

13. 24 is 3 fifths of what number?

14. 24 is $\frac{6}{7}$ of what number?

15. 25 is $\frac{5}{8}$ of what number?

16. 36 is $\frac{6}{7}$ of what number?

17. 20 is $\frac{5}{6}$ of what number?

18. 27 is $\frac{9}{10}$ of what number?

19. 15 is $\frac{3}{7}$ of what number?

20. If $\frac{5}{7}$ of a barrel of fish cost \$10, what will 1 barrel cost?

21. 8 is $\frac{4}{5}$ of what number?

22. 6 is $\frac{3}{4}$ of what number?

23. A is 10 years old, which is $\frac{1}{5}$ of B's age; required B's age.

24. How many thirds in $3\frac{1}{3}$? In $4\frac{1}{3}$?

To find a part of a decimal, or to divide a decimal fraction by a whole number of 2 figures.

```
    1.32
36 ) 47.86
     36
     ---
     118
     108
     ---
      106
       72
      ---
       34
```

The explanation here is the same as in Lesson 45, and need not be repeated. Place the point when you write tenths. Notice also that the point in the quotient comes above the point in the dividend.

Divide:

1. 24)45.84 35)474.25 46)17.48 26)58.64

2. 57)68.91 68)108.8 79)56.09 35)52.40

3. 83)748.66 92)800.4 23)48.76 30)642.0

4. 34)768.4 45)62.10 56)80.64 32)684.8

5. 67)74.37 78)81.12 89)925.6 34)69.08

6. 91)982.8 22)46.20 33)475.2 35)72.53

7. 44)55.44 55)62.15 66)487.8 45)96.48

8. 77)816.2 88)95.92 99)100.04 36)86.36

9. 82)90.34 27)69.79 53)86.45 43)83.75

10. 49)98.37 62)91.28 42)956.8 53)869.5

11. 37)26.64 36)219.6 35)122.5 47)150.4

12. 92)56.12 72)48.24 98)607.6 23)49.91

13. 23)95.91 82)36.90 78)66.30 28)84.56

14. 72)663.6 61)561.2 52)94.64 43)52.89

ORAL.

1. How many half dollars in $2.50?

2. How many thirds in $2\frac{1}{3}$? $3\frac{1}{3}$?

3. Find the sum of $\frac{5}{12}$, $\frac{3}{12}$, and $\frac{7}{12}$.

4. Mary earned $\frac{5}{8}$ of a dollar, and spent $\frac{3}{8}$ of a dollar. How many quarters had she left?

5. Mr. S. had a lot containing $3\frac{2}{5}$ acres. He bought a lot containing $2\frac{4}{5}$ acres, and then sold $1\frac{3}{5}$ acres. How many acres had he left?

6. What is the difference between 2 sq. ft. and 2 ft. square?

7. A tower is 240 ft. high. How many yards is that?

8. If 4 oranges are worth 3 cents, how many oranges are worth 12 cents?

9. One-eighth of a cord of wood costs 80 cents. What is the value of $\frac{1}{2}$ of a cord at the same rate?

10. A farmer bought a cow, and paid $20 in cash, which was $\frac{2}{5}$ of the price. What was the cost of the cow?

11. If I have $54, and give $\frac{5}{6}$ of it for wood, how much do I pay out for wood? How many cords do I buy at $5 a cord?

12. John, who is 15 yr. old, is $\frac{5}{7}$ of the age of Henry. How old is Henry?

13. $18 is $\frac{9}{10}$ of the price of a shawl. What is the price of the shawl?

14. How many fourths in $1\frac{1}{4}$? $2\frac{3}{4}$? $3\frac{2}{4}$? $5\frac{1}{4}$?

15. A boy's wages for 7 weeks are $63. What did he earn in 4 weeks?

16. How many fifths in 4? $4\frac{2}{5}$? $5\frac{1}{5}$? 8? $9\frac{4}{5}$?

17. How many units in $\frac{10}{5}$? $\frac{20}{5}$? $\frac{15}{5}$? $\frac{13}{5}$?

18. How can any number be changed to tenths?

19. In what time will 8 girls pick a bushel of berries, if 4 girls can do it in 8 hours?

20. If 10 men can dig 30 rods of ditch in one day, how much can 12 men dig in the same time?

1. If a boy earns \$9.50, and spends \$2.35 for books, how much of his money will he have left?

2. What must be paid for 5 cheeses weighing 85 lb. each, at 16¢ a pound?

3. A milkman sold milk at 7¢ a quart. If he received 8645 cents, how many quarts did he sell?

4. Mr. Green earned \$28.68 a month, and spent $\frac{1}{12}$ of it for books. How much did he spend? How much did he have left?

5. How many square yards in a floor that is 15 ft. long and 18 ft. wide?

6. In a walk 20 ft. long and 6 ft. wide, how many square feet?

7. I have a paper weight in the shape of a pyramid, measuring 4 in. square on the base, and 5 in. in its slant height. How many square inches are there in one face? In the four faces?

8. A boy who weighed 80 pounds, lost 10 pounds by illness. What per cent of his weight did he lose?

9. A watch which cost \$20 was sold for \$15. How many dollars were lost? What per cent was lost?

10. What per cent of 80 is 20?

11. Find the cost of 18½ bu. of potatoes at 40¢ a peck?

12. Change 200 qt. to gallons, 200 bu. to pecks.

13. If 2 bbl. make a hogshead, how many quarts are there in a hogshead?

14. Find the cost of 37 gal. of oil at 19¢ a gal.?

15. Find the cost of 48 bu. of oats at 59¢ a bushel?

16. Change 6400 gills to pints, your pints to quarts, your quarts to gallons. How many gallons have you?

17. Change 1600 pints to quarts, your quarts to pecks, your pecks to bushels. How many bushels have you?

18. If you bought 50 bu. of potatoes at 87¢ a bushel, and sold them at 30¢ a peck, how much did you gain?

19. What is the value of 13 horses at \$176 each, and 19 cows at \$37 each?

ORAL.

1. A boy who earned \$6 a week, spent $33\frac{1}{3}\%$ of it for dinners. What did he pay for his dinners?

2. A man bought a table for \$8, and sold it at a gain of 25%. What did he get for the table?

3. What per cent of 20 is 10? Is 5?

4. What per cent of 100 is 50? Is 25?

5. In a class of 20 children 50% were absent. How many were absent?

6. If a man sells a load of wood for \$16 which cost him \$12, what per cent of the cost is the gain?

7. A jeweller bought a pin for \$2, which was 50% of what he sold it for. What did he sell it for?

8. If you have 18 marbles and lose 6, what per cent do you lose?

9. A pail of berries weighed 3 lb. After a part was sold, it only weighed $66\frac{2}{3}\%$ as much. How much did it weigh then?

10. A man bought a barrel of cranberries for \$4.00, and sold them at a gain of 75%. What price did he sell them for?

11. A grass plot that is 3 yd. square contains how many square feet?

12. Find 2 times $\frac{1}{3}$ of 63.

13. Find 4 times $\frac{2}{3}$ of 63.

14. Find the difference between $\frac{1}{3}$ of 63 and $\frac{1}{9}$ of 63.

15. Find the difference between $\frac{1}{7}$ of 63 and $\frac{1}{9}$ of 63.

16. Add $\frac{1}{7}$ of 63 and $\frac{1}{9}$ of 63.

17. A room is 8 yd. long and 5 yd. wide. What is the area of its floor?

18. If this same room is 9 ft. high, what is the area of one side? Of both sides? Of one end? Of both ends?

19. A farmer wishes to make a grain bin 8 ft. long, 5 ft. wide, and 4 ft. deep. How many square feet of boards will he have in the cover? In the bottom? In one end? In one side?

NUMERATOR AND DENOMINATOR.

A fraction is one or more of the equal parts of a unit.

1. What is the expression $\frac{2}{3}$ called?

2. Why is it called a fraction?

3. Into how many parts has the unit been divided?

4. In the expression, 2 books, what is the name of the thing mentioned?

5. In the expression $\frac{2}{3}$, what is the name of the thing mentioned?

6. In the expression $\frac{2}{3}$, the 3 tells us that a unit has been divided into thirds. We call the 3 the *denominator*, which means that which names.

7. In each of the following fractional expressions tell the denominator, and also tell what it shows us: $\frac{1}{2}$, $\frac{2}{3}$, $\frac{3}{4}$, $\frac{4}{5}$, $\frac{5}{6}$, $\frac{6}{7}$, $\frac{7}{8}$, $\frac{8}{9}$, $\frac{9}{10}$, $\frac{10}{11}$.

8. Of the fractional disks, find the one that illustrates thirds. Take two of these thirds. Write that as a fraction.

9. You have written $\frac{2}{3}$. In this expression what does the 2 tell us?

10. The 2 counts or enumerates the number of parts that we have taken of the thirds. We call it the *numerator*, because it tells us the number of the parts of the unit that we are using.

11. In the following fractions name the numerators, and tell what they show us: $\frac{3}{4}$, $\frac{8}{12}$, $\frac{7}{9}$, $\frac{5}{8}$, $\frac{11}{14}$, $\frac{1}{6}$, $\frac{2}{7}$, $\frac{5}{9}$, $\frac{9}{12}$, $\frac{12}{20}$.

12. What is the denominator, and why so called?

13. What is the numerator, and why so called?

14. In the following fractions name both numerator and denominator: $\frac{8}{12}$, $\frac{6}{8}$, $\frac{9}{11}$, $\frac{7}{12}$, $\frac{4}{10}$, $\frac{5}{13}$, $\frac{7}{9}$, $\frac{4}{8}$, $\frac{2}{3}$, $\frac{1}{9}$.

15. Subtract:

$10\frac{3}{4} - 4\frac{1}{4}$	$18 - 9\frac{7}{8}$	$12\frac{3}{4} - 7\frac{1}{2}$
$8\frac{7}{8} - 3\frac{5}{8}$	$15\frac{3}{8} - 6\frac{3}{4}$	$8\frac{2}{3} - 3\frac{1}{6}$
$4\frac{1}{3} - 1\frac{2}{3}$	$14\frac{1}{4} - 8\frac{1}{2}$	$8\frac{3}{4} - 4\frac{1}{4}$
$9 - 4\frac{3}{4}$	$10\frac{5}{8} - 4\frac{1}{4}$	$12 - 7\frac{7}{12}$

ORAL.

1. At $\frac{3}{4}$ of a dollar for one yard of cloth, what will be the cost of 8 yards?

2. Find the cost of 7 bu. of apples at $\frac{4}{5}$ of a dollar a bushel. At $\frac{2}{3}$ of a dollar. At $\frac{5}{7}$ of a dollar.

3. How much will 6 lb. of tea cost at $\frac{3}{4}$ of a dollar a pound? At $\$\frac{4}{5}$ per pound? At $\$\frac{2}{3}$ per pound? At $\$\frac{5}{7}$ per pound?

4. A father gave to each of 3 children $\frac{2}{5}$ of a dollar. How much did he give in all?

5. What is the cost of $\frac{3}{5}$ of a pound of sugar at $15\not{c}$ a pound?

6. What is the cost of $\frac{3}{4}$ of a pound of candy at $36\not{c}$ a pound? At $24\not{c}$ a pound? At $48\not{c}$ a pound?

7. What is the cost of $\frac{5}{8}$ of an acre of land at \$32 an acre? At \$48 an acre? At \$72 an acre? At \$96 an acre?

8. If a load of hay costs \$12, what is the value of $\frac{1}{3}$ of it? Of $\frac{3}{4}$ of it? Of $\frac{5}{6}$ of it?

9. In order that Henry may give $\frac{2}{3}$ of an orange to James, into how many parts must he cut his orange?

10. How many gallons in 16 qt.? In 28 qt.?

11. At $12\not{c}$ a peck, how many pecks of potatoes can be bought for 36 cents? For 96 cents?

12. At $25\not{c}$ a yard, how many yards of cloth can be bought for 50 cents? 75 cents? \$1? \$8?

13. If 3 yd. of cloth cost \$6, what will be the cost of 8 yards? 10 yd.? 15 yd.?

14. At \$4 a barrel, how many barrels of flour can be bought for \$3600?

15. If 4 yd. of cloth make a suit of clothes, how many suits can be made from 3600 yards?

16. How many times 5 bu. are 30 bu.? 40 bu.? 20 bu.? 60 bu.? 45 bu.?

17. What is the area of a triangle whose base is 7 in., and altitude 4 in.?

1. What number is that which being increased by 12 equals 26?

2. $\frac{1}{2} - \frac{1}{3} = ?$ $\frac{1}{5} - \frac{1}{6} = ?$ $\frac{3}{4} - \frac{2}{3} = ?$ $\frac{3}{4} - \frac{3}{5} = ?$
$\frac{1}{4} - \frac{1}{5} = ?$ $\frac{1}{6} - \frac{1}{7} = ?$ $\frac{4}{5} - \frac{2}{3} = ?$ $\frac{2}{3} - \frac{2}{5} = ?$
$\frac{1}{4} - \frac{1}{6} = ?$ $\frac{1}{7} - \frac{1}{8} = ?$ $\frac{3}{6} - \frac{2}{5} = ?$ $\frac{2}{3} - \frac{2}{7} = ?$

3. How much will 3 knives cost, if 18 knives cost $24?

4. If 4 men can do a piece of work in 18 days, how long will it take 12 men to do it?

5. Multiply:

35	64	65	56	76	43	64	85
32	42	32	34	24	38	75	94

6. Multiply:

435	634	754	528	807	725
32	43	35	46	64	45

7. $3\overline{)567}$ $5\overline{)975}$ $7\overline{)826}$ $8\overline{)1376}$ $7\overline{)595}$

8. A rectangular table is 24 in. wide and 36 in. long. How many square inches does it contain?

9. In the table in the 8th example, how many square feet are there?

10. A rectangular box is 4 ft. long, 4 ft. wide, and 3 ft. deep. Find the number of blocks that you can put into it, if each block is a cubic foot.

11. Find the number of square feet of paper that it will take to line the box in example 10.

12. Find the number of square inches in each of the following rectangles. Make a drawing of each, using a $\frac{1}{4}$ scale:

(*a*) 12 in. long by 6 in. wide.
(*b*) 16 in. long by 12 in. wide.
(*c*) 20 in. long by 10 in. wide.
(*d*) A 15 inch square.

13. John Smith paid $1.37 for a pair of skates, and sold them for $2.11. How much did he gain?

ORAL.

1. $2\frac{1}{2}$ ft. and $4\frac{1}{2}$ ft. are how many feet?

2. \$7.50 and \$4.25 equal how many dollars?

3.

$16 + 3 - 9$	$27 + 6 - 4$	$100 - 45$	$100 - 65$
$42 - 30$	$50 - 16$	$50 - 12$	$100 - 88$
$64 - 8$	$25 - 7 - 8$	$75 - 62$	$50 - 12$
$82 - 20$	$60 - 12$	\$5.00 − \$2.75	\$10 − \$4.25

4. Mr. Brown receives \$60. He pays \$15 for rent, and \$15 for coal. How much has he left?

5. After 16 qt. are put into a bushel basket, how many more quarts are needed to fill it?

6. How do you multiply any number by 10? By 100?

7. How do you divide any number by 10? By 100?

8.

Divide:	760 by 10.	800 by 100.	740 by 10.
	890 by 10.	1200 by 100.	870 by 10.
	420 by 10.	6500 by 100.	940 by 10.
	645 by 10.	8750 by 100.	

9.

Multiply:	18 by 10.	5 by 100.	17 by 10.
	27 by 10.	25 by 100.	48 by 10.
	63 by 10.	32 by 100.	67 by 10.
	95 by 10.	76 by 100.	81 by 10.

10. How many pecks in 40 quarts?

11. How many minutes from half-past eight to nine o'clock?

12. Frank's uncle gave him \$2.00, with which he bought two balls for \$1.10, and a bat for 50 cents.

13. What will 23 typewriters cost at \$100 each?

14. James Smith bought a bicycle for \$75, and agreed to pay \$11 down, and \$8 a month afterwards. How many months did it take him to pay for it?

15. If you cut $2\frac{1}{2}$ in. from a stick 7 in. long, how long a piece will remain?

16. What is the smallest coin in our money?

17. What will $\frac{1}{2}$ bu. of potatoes cost at 25¢ a peck?

Change:

1. 7 lb. 5 oz. to ounces.
2. 14 gal. 3 qt. to quarts.
3. 28 qt. 1 pt. to pints.
4. 18 bu. 3 pk. to pecks.
5. 17 pk. 7 qt. to quarts.
6. 49 bu. to quarts.
7. 5 yd. to inches.
8. 14 yd. 2 ft. to feet.
9. 13 ft. 3 in. to inches.
10. 70 ft. to yards and feet.
11. 24 lb. 12 oz. to ounces.
12. 19 lb. 4 oz. to ounces.
13. 63 gal. 3 qt. to quarts.
14. 24 gal. 1 qt. to quarts.
15. 98 ft. to inches.
16. 75 bu. to quarts.
17. 33 yd. to inches.
18. 135 gal. to pints.
19. 19 ft. 11 in. to inches.
20. 18 bu. 3 pk. to pecks.
21. 7 qt. 1 pt. to pints.
22. 4 gal. 1 pt. to pints.
23. 69 oz. to pounds and ounces.
24. 82 qt. to gallons and quarts.
25. 47 pt. to quarts and pints.
26. 97 qt. to pecks and quarts.
27. 87 pk. to bushels and pecks.
28. 119 in. to feet and inches.
29. How many quarts in 40 pints?
30. How many bushels in 40 pecks?
31. 64 quarts equals —— pecks?
32. If 16 pints of milk cost 64 cents, what does 1 gallon cost?
33. I bought 30 pecks of apples at 30¢ a peck, and sold them at 35¢ a peck. How much did I gain?
34. I bought 15 bu. of apples at $1.00 a bushel, and sold them at 30¢ a peck. How much did I gain?
35. What will 6 gal. 3 qt. of vinegar cost at 7¢ a quart?
36. What is the price of apples a bushel when they are selling at 12¢ a half-peck?
37. If a pound of coffee costs 38 cents, what will $4\frac{1}{2}$ pounds cost?
38. At 80¢ a pound, what will $\frac{1}{4}$ of a pound of tea cost?

ORAL.

1. Eli's age, which is 7 years, is $\frac{1}{5}$ of his grandfather's age.

2. 3 qt. 3 pt. of vinegar are how many pints?

3. If a blacksmith uses 8 nails in setting a shoe, how many nails does he use in shoeing a horse?

4. How many working days are there in 9 weeks?

5. Alfred is 15 years old, Edwin is 11, and Oscar is 9. What is the sum of their ages?

6. Three men bought a horse, the first man paying $35, the second man $15, and the third man as much as the first two. How much did the horse cost?

7. A woman paid $.50 for sugar, $.16 for crackers, and $.09 for starch. How many cents did she pay out? How much less than $1 did she spend?

8. $\frac{1}{2}$ of 40 and $\frac{1}{4}$ of 20 are how many times 5?

9. What number is 9 more than 8 times $\frac{1}{7}$ of 42?

10. What is the difference between 6 times 9 plus 5, and 8 times 8 minus 5?

11. If I gain $8 by selling a wagon for $98, how much did the wagon cost me?

12. How many 6-cent stamps can I buy for 54 cents?

13. If a girl can make 7 pairs of cuffs in an hour, how many pairs can she make in 8 hours?

14. From 7 times 8 take $\frac{1}{2}$ of 8, add $\frac{1}{4}$ of 28, subtract seven 7's, and multiply by $\frac{1}{5}$ of 25.

15. A farmer had 69 sheep, and sold 11 of them. How many sheep had he left?

16. The area of the top of a rectangular table 4 ft. long by $2\frac{1}{2}$ ft. wide is —— square feet?

17. How many square feet in a sidewalk 100 ft. long by 4 ft. wide?

18. What is the cost of 6 qt. of milk at 4¢ a pint?

19. How many weeks in 14 days? In 28 days? In 140 days?

1. Add:	$14\frac{1}{2}$	$20\frac{1}{2}$	$33\frac{1}{2}$	$14\frac{3}{4}$	$25\frac{1}{3}$
	$3\frac{1}{3}$	$15\frac{2}{3}$	$20\frac{1}{3}$	$9\frac{2}{3}$	$25\frac{1}{3}$
	$1\frac{1}{4}$	$6\frac{1}{4}$	$11\frac{3}{4}$	$5\frac{1}{2}$	$25\frac{1}{3}$
2. Add:	$81\frac{1}{4}$	$27\frac{2}{3}$	$56\frac{1}{4}$	$65\frac{2}{3}$	$80\frac{2}{3}$
	$80\frac{1}{4}$	$19\frac{1}{4}$	$8\frac{1}{3}$	$19\frac{3}{4}$	$5\frac{3}{4}$
	$5\frac{1}{3}$	$3\frac{1}{3}$	$2\frac{3}{4}$	$7\frac{1}{3}$	$10\frac{2}{3}$
3. Add:	$22\frac{1}{2}$	$37\frac{1}{2}$	$9\frac{1}{3}$	$75\frac{1}{3}$	$84\frac{1}{3}$
	$5\frac{1}{4}$	$16\frac{1}{3}$	$3\frac{1}{3}$	$20\frac{1}{4}$	$10\frac{1}{4}$
	$1\frac{1}{8}$	$5\frac{1}{6}$	$1\frac{1}{9}$	$3\frac{1}{2}$	$2\frac{1}{6}$
4. Subtract:	$95\frac{1}{2}$	$87\frac{1}{8}$	$70\frac{1}{3}$	$62\frac{1}{3}$	$51\frac{2}{3}$
	$70\frac{1}{6}$	$16\frac{1}{4}$	$24\frac{1}{6}$	$37\frac{1}{4}$	$48\frac{1}{4}$
5. Subtract:	$75\frac{1}{2}$	$87\frac{2}{3}$	$52\frac{7}{8}$	$40\frac{5}{8}$	$31\frac{5}{6}$
	$61\frac{1}{3}$	$28\frac{1}{2}$	$14\frac{1}{8}$	$9\frac{1}{4}$	$13\frac{1}{3}$
6. Multiply:	$17\frac{2}{3}$	$45\frac{5}{6}$	$27\frac{3}{4}$	$65\frac{7}{8}$	$48\frac{8}{9}$
	18	12	24	32	27
7. Multiply:	$58\frac{4}{7}$	$96\frac{1}{6}$	$83\frac{5}{8}$	$76\frac{5}{7}$	$62\frac{7}{9}$
	49	66	56	28	81
8. Multiply:	$29\frac{5}{6}$	$37\frac{3}{5}$	$81\frac{1}{4}$	$37\frac{2}{3}$	$59\frac{1}{6}$
	48	75	88	99	72
9. Subtract:	$84\frac{1}{2}$	$52\frac{1}{2}$	$81\frac{3}{4}$	$72\frac{1}{4}$	$68\frac{2}{3}$
	$47\frac{1}{4}$	$48\frac{2}{3}$	$63\frac{1}{2}$	$49\frac{1}{8}$	$34\frac{1}{10}$
10. Subtract:	$69\frac{2}{3}$	$19\frac{3}{4}$	$38\frac{5}{6}$	$42\frac{1}{2}$	$79\frac{5}{8}$
	$52\frac{1}{2}$	$11\frac{1}{2}$	$19\frac{2}{3}$	$27\frac{3}{4}$	$58\frac{3}{4}$
11. Multiply:	$66\frac{3}{4}$	$35\frac{7}{8}$	$87\frac{5}{6}$	$95\frac{6}{7}$	$83\frac{2}{3}$
	24	32	36	49	48

ORAL.

1. What will 8 sheets of paper cost at 18¢ a quire?

2. How much will 9 eggs cost at 20¢ a dozen?

3. How many eggs in $2\frac{1}{2}$ dozen? In half a dozen? In a dozen and a quarter?

4. How many pecks in 4 bu.? 9 bu.?

5. How many bushels in 20 pk.? 40 pk.?

6. If a unit is divided into 10 equal parts, what is one of the parts called?

7. If $\frac{1}{10}$ is divided into 10 equal parts, what is one of the parts called?

8. In the expression 2.5, what does the period between the 2 and the 5 denote?

9. If a barrel of apples costs $\$2\frac{1}{4}$, how many "quarters" does it cost?

10. If 2 lb. of meat cost 32 cents, what will $\frac{3}{8}$ of a pound cost?

11. If 1 bbl. of apples costs \$4, what will $\frac{3}{4}$ of a barrel cost?

12. If 7 lb. of sugar cost 56 cents, what will $4\frac{1}{2}$ lb. cost?

13. If $\frac{1}{5}$ of a yard of cloth is worth 24 cents, what is 1 yd. worth? 3 yd.?

14. How much will $4\frac{2}{3}$ yd. of muslin cost at 6¢ a yard?

15. How many fifths in $6\frac{3}{5}$? $7\frac{2}{5}$? $8\frac{1}{5}$? $12\frac{4}{5}$?

16. How many sevenths in $7\frac{4}{7}$? $9\frac{2}{7}$? $8\frac{5}{7}$? $10\frac{6}{7}$?

17. If a yard of muslin costs 24 cents, what will $\frac{1}{4}$ of a yard cost? $\frac{1}{2}$ of a yard? $\frac{3}{4}$ of a yard?

18. If 5 melons cost 60 cents, what will 7 melons cost at the same rate?

19. What is $\frac{1}{6}$ of 48? 72? 84? 90? 96?

20. How many yards of ribbon, at 8¢ a yard, can be bought for 56 cents.

21. How many days must a man work, at \$3 a day, to earn \$45?

1. A farmer values his horses at $350, his cows at $275, his sheep at $411.75, his hogs at $129.25, and his poultry at $27.25. What is his value of all?

2. From $369.72 take $126.41.

3. Multiply 642 by 10. By 100.

4. Multiply 5246 by 18.

5. At $72 an acre, how many acres of land can be bought for $2664?

6. Change the following to whole or mixed numbers: — $\frac{14}{3}$, $\frac{21}{5}$, $\frac{32}{7}$, $\frac{45}{9}$, $\frac{48}{11}$.

7. $17\frac{1}{5} - 8\frac{2}{5} = ?$

8. Multiply $15\frac{8}{9}$ by 9.

9. Multiply $4\frac{7}{8}$ by 9.

10. Find the cost of 1272 articles at 25¢ each.

11. Find the cost of 575 articles at 50¢ each.

12. What is the area of a rectangle 12 rd. by 18 rd.?

13. What is the perimeter of the same rectangle?

14. Find the number of square feet in the ceiling and walls of a room that is 36 ft. by 48 ft. and 12 ft. high?

15. What is 20% of 630 bushels?

16. A farmer has 42 pigs. He keeps 29 pigs, and sells the others at $5 each. How much does he receive for the pigs he sells?

17. I own 20 acres of land. I keep $18\frac{1}{4}$ acres, and sell the rest at $40 per acre. How much do I receive for it?

18. Subtract: —

$49\frac{1}{2}$	$68\frac{1}{2}$	10	10	30
$25\frac{1}{2}$	34	$9\frac{1}{2}$	$8\frac{1}{2}$	$27\frac{1}{2}$

19.

10	25	32	54	75
$5\frac{1}{2}$	$6\frac{1}{2}$	$18\frac{1}{2}$	$50\frac{1}{2}$	$74\frac{1}{2}$

20. Multiply 1836 by 32.

ORAL.

1. 76 tenths are how many ones?

2. Nineteen are how many times 3? 7? 4? 5? 8? 6? 9? 2? 10?

3. Twenty-seven are how many times 9? 6? 4? 3? 7? 8? 5? 10?

4. If 6 is $\frac{3}{4}$ of some number, what is 1 fourth of the same number?

5. 9 is 3 fourths of what number?

6. 8 is 4 ninths of what number?

7. 9 is 3 tenths of what number?

8. 10 is 5 sevenths of what number?

9. 12 is 3 fifths of what number?

10. If I plant $\frac{1}{8}$ of my garden with peas, $\frac{1}{8}$ with beans, $\frac{3}{8}$ with potatoes, and $\frac{2}{8}$ with tomatoes, how many eighths shall I have left for other things?

11. A man who had a fence to build, found that it took him 4 days to build 2 fifths of it. How many days did it take him to build the whole fence?

12. What will 5 pictures cost at $8\frac{3}{5}$¢ each?

13. What will 12 hats cost at $\$3\frac{3}{4}$ each?

14. How many oranges will it require to give each of 9 boys $1\frac{1}{3}$ oranges?

15. 5 times 4 and $\frac{3}{4}$ of 4 are how many?

16. 9 times 7 and $\frac{5}{7}$ of 7 are how many?

17. 5 times 10 and $\frac{4}{5}$ of 10 are how many?

18. 7 times 6 and $\frac{4}{6}$ of 6 are how many?

19. What will 6 boxes of raisins cost at $\$3\frac{2}{3}$ a box?

20. A boy gave $\frac{4}{5}$ of a dollar for a hat, $\$1\frac{2}{5}$ for a vest, and had $\$3\frac{4}{5}$ remaining. How much had he at first?

21. 14 is 2 sevenths of what number?

22. 15 is 3 halves of what number?

23. 24 is 8 fifths of what number?

1. How many square feet of boards will it take to cover the end of a house 20 ft. long and 12 ft. wide?

2. John bought a sled for $2.00, and lost it. What per cent of his investment did he lose?

3. A man owning a factory worth $2500, sold 50% of it. What was the value of the part sold?

4. A farmer had a flock of 350 sheep, of which 10% were killed. How many sheep did he lose?

5. How many cubic feet in a pile of wood 60 ft. long, 4 ft. wide, and 8 ft. high?

6. If $\frac{5}{8}$ of a farm is worth $4000, what is the value of the whole farm?

7. Mr. A had a farm of 640 acres. He sold $\frac{5}{8}$ of it for $25 per acre. What did he receive?

8. A man bought $\frac{1}{5}$ of 400 acres of land for $118 an acre. What did it cost him?

9. If 18 tons of coal last a factory 126 days, how long will 145 tons last at the same rate?

10. $\frac{5}{8}$ of a farm is worth $6240. What is the whole farm worth? What is $\frac{3}{4}$ of it worth?

11. How many cubic feet in a rectangular block of granite 8 ft. long, 4 ft. wide, and 3 ft. thick?

12. If a cubic foot of granite weighs 155 lb., what is the weight of the block of granite in example 11?

13. I exchanged 15 cords of wood at $6 a cord, for 45 yd. of cloth. What was the value of the cloth per yard?

14. I exchanged 28 horses, worth $115 each, for cows valued at $35 each. How many cows did I receive?

15. What is the cost of 9 tons of coal at $5.50 per ton?

16. In what time will 48 men do a piece of work that 12 men can do in 24 days?

17. What is the sum of $5\frac{1}{4}$, $6\frac{7}{8}$, $4\frac{1}{2}$?

18. Subtract $2\frac{1}{2}$ from $5\frac{5}{8}$.

ORAL.

1. $\frac{1}{8}$ of 56 less $\frac{1}{8}$ of 32 is what?

2. 6 times $\frac{1}{2}$ of 16 is what?

3. $\frac{1}{9}$ of 72 plus $\frac{1}{8}$ of 64 are how many?

4. When a suit of clothes costs \$9, how many suits can be bought for \$72?

5. Charles is 9 years old, and his father is 4 times as old.

6. $\frac{1}{10}$ of 80 and $\frac{1}{7}$ of 49 equal —— ?

7. Give quotients:

6) 42	3) 27	4) 36	6) 12	7) 56
6) 54	3) 30	8) 48	9) 63	6) 48
9) 45	8) 24	2) 18	4) 16	7) 28
7) 35	2) 16	3) 21	6) 54	4) 32
8) 72	8) 32	6) 18	6) 24	7) 63

8. $\frac{5}{8} + \frac{3}{8}$. $1 - \frac{3}{8}$. $2 \times \frac{4}{8}$. $1 - \frac{7}{8}$.

9. Count change for Mr. Ward, who sells 7 qt. of milk at 8¢, and receives 3 silver quarters.

10. If you were a clerk, how would you count change for 51 cents, if the buyer gave you \$1.00?

11. If a grocer buys pepper for 11¢ a pound, and sells it for 16¢ a pound, how much does he make on 10 pounds?

12.

$\frac{1}{4}$ of 32.	$\frac{1}{7}$ of 28.	$\frac{1}{8}$ of 16.	$\frac{1}{6}$ of 12.
$\frac{1}{9}$ of 45.	$\frac{1}{7}$ of 35.	$\frac{1}{8}$ of 72.	$\frac{1}{6}$ of 54.
$\frac{1}{6}$ of 18.	$\frac{1}{8}$ of 32.	$\frac{1}{4}$ of 16.	$\frac{1}{9}$ of 63.
$\frac{1}{7}$ of 21.	$\frac{1}{5}$ of 20.	$\frac{1}{8}$ of 56.	$\frac{1}{3}$ of 21.
$\frac{1}{5}$ of 35.	$\frac{1}{6}$ of 30.	$\frac{1}{5}$ of 40.	$\frac{1}{9}$ of 81.
$\frac{1}{9}$ of 72.	$\frac{1}{9}$ of 36.	$\frac{1}{7}$ of 56.	$\frac{1}{5}$ of 45.

13. Draw two oblongs to show that $\frac{1}{5}$ is the same as $\frac{2}{10}$.

14. While carrying 5 doz. eggs to market, John broke 8 eggs.

15. Give products:

2 × \$20	5 × \$40	6 × \$30	7 × \$20
3 × \$30	8 × \$60	9 × \$50	4 × \$80
4 × \$50	3 × \$70	8 × \$30	9 × \$40

NOTE. — Do not compel each child to perform all.

The following represents cash received and cash paid out in a store for the month of March. Find the difference for each day, and for the month.

	RECEIVED.	PAID.		RECEIVED.	PAID.
1.	$247.85	$218.15	17.	$ 32.98	$ 3.95
2.	5.96	53.86	18.	500.00	188.50
3.	10.00	27.89	19.	50.00	74.00
4.	8.13	5.06	20.	48.75	50.00
5.	397.63	98.32	22.	85.35	79.85
6.	142.15	114.18	23.	18.50	41.25
8.	16.85	7.62	24.	45.50	134.14
9.	2.63	3.27	25.	446.14	9.63
10.	18.95	20.25	26.	532.13	2.65
11.	215.12	14.98	27.	513.68	1.60
12.	32.98	25.00	29.	180.00	27.84
13.	47.63	92.80	30.	39.39	14.65
15.	87.63	3.85	31.	557.00	136.00
16.	254.85	215.12			

32. Multiply $10\frac{2}{3}$ by 9.

33. Reduce 45 bu. 3 pk. 5 qt. to quarts.

34. How many hours are there in 3 wk. 5 d. 10 hr.?

35. How many square rods are there in a rectangular field 40 rd. long and 20 rd. wide?

36. How much will it cost to fence this field at $1 a rod?

37. In a rectangular block of stone 6 ft. long and 2 ft. square, how many cubic feet?

38. How many square feet in the entire surface of this block of stone?

39. Bought a horse for $216, and sold him at a loss of 10%. How much was the loss?

40. Multiply 4.02 by 10. By 100.

41. Divide 102.05 by 10. By 100.

ORAL.

1. Give products:—

684×10	68.4×10	3128×10
57.1×100	5.71×10	$.961 \times 100$
$.57 \times 100$	$.09 \times 100$	$.02 \times 100$

2. Give quotients:—

$932 \div 100$	$684 \div 100$	$86 \div 10$
$328 \div 10$	$57.6 \div 10$	$24.3 \div 100$
$8.75 \div 10$	$932.5 \div 100$	$48 \div 100$

3. How many square feet in a rectangle 2 ft. long and 1 ft. wide? In one 6 ft. long and 5 ft. wide? In one 9 ft. long and 7 ft. wide?

4. A man sees 15 pigeons on one branch of a tree and 9 pigeons on another branch. If 7 should fly away, how many would be left on the tree?

5. A farmer had 23 chickens, but 7 of them were stolen, and 5 were carried off by a hawk. How many chickens had he left?

6. Mr. S. is 44 years old, and his youngest son is 8 years old. What is the difference in their ages?

7. A man, having \$23, gave \$6 for a hat. How many dollars had he left?

8. What part of a gallon is 1 quart? 2 qt.? 3 qt.? 4 qt.?

9. How many pints in 8 qt.? 11 qt.? $15\frac{1}{2}$ qt.? 20 qt.?

10. At 4¢ a pint, what will 5 qt. of milk cost?

11. How many bushels in 12 pk.? 20 pk.? 32 pk.? 40 pk.?

12. What part of a bushel is 1 pk.? 2 pk.? 3 pk.? 4 pk.?

13. How many weeks in 35 days? In 49 days?

14. What per cent of 120 is 60?

15. What per cent of 12 is 3?

16. \$70 is 10% of how many dollars?

17. A dealer paid \$5 for a hat, and sold it at 20% profit. What was the selling price?

To find cost of articles at $33\frac{1}{3}¢$ each, and at $20¢$ each.

Since $33\frac{1}{3}¢$ is $\frac{1}{3}$ of \$1, it follows that three articles will cost \$1; hence any number of articles at $33\frac{1}{3}¢$ each will cost as many dollars as $\frac{1}{3}$ the number of articles.

Since $20¢$ is $\frac{1}{5}$ of \$1, it follows that 5 articles will cost \$1; hence any number of articles at $20¢$ each will cost as many dollars as $\frac{1}{5}$ the number of articles.

Find cost, at $33\frac{1}{3}¢$ each, of:

1. 36 yd. of ribbon.
3. 48 lb. of butter.
5. 27 lb. of butter.
7. 66 lb. of meat.
9. 933 yd. of velvet.
11. 600 pk. of peaches.
13. 12 gal. of molasses.
15. 624 doz. oranges.
17. 420 pt. of ice-cream.
19. 981 lb. of turkeys.

Find cost at $20¢$ each of:

2. 65 pairs of cuffs.
4. 55 pk. of walnuts.
6. 75 doz. oranges.
8. 155 yd. of cloth.
10. 735 books.
12. 80 jars of jelly.
14. 695 lb. of meat.
16. 105 yd. of sheeting.
18. 5175 lb. wool.
20. 600 bu. tomatoes.

Multiply:

21. 25 cents by 240.
23. 50 cents by 186.
25. $33\frac{1}{3}$ cents by 156.
22. $33\frac{1}{3}$ cents by 66.
24. 20 cents by 640.
26. 50 cents by 84.

Find the cost of:

27. 2504 dolls at $25¢$.
29. 933 yd. of cloth at $33\frac{1}{3}¢$.
31. 72 articles at $33\frac{1}{3}¢$.
33. 72 articles at $50¢$.
28. 1728 hats at $50¢$.
30. 695 lb. of meat at $20¢$.
32. 72 articles at $25¢$.
34. 570 articles at $20¢$.

35. Multiply: $1\frac{5}{16}$ by 8. $1\frac{7}{12}$ by 4. $2\frac{9}{20}$ by 10. $5\frac{5}{12}$ by 6.
$1\frac{5}{14}$ by 7. $1\frac{3}{16}$ by 8. $1\frac{5}{12}$ by 12. $9\frac{2}{3}$ by 9.

36. Multiply: $\frac{11}{20}$ by 10. $\frac{8}{9}$ by 9. $1\frac{5}{8}$ by 6. $4\frac{3}{4}$ by 8.
$\frac{5}{8}$ by 80. $\frac{7}{8}$ by 4. $\frac{11}{18}$ by 7. $7\frac{1}{2}$ by 6.

37. Multiply: $1\frac{1}{2}$ by 6. $5\frac{3}{8}$ by 8. $2\frac{1}{4}$ by 8. $2\frac{1}{6}$ by 12.
$1\frac{1}{3}$ by 6. $4\frac{5}{9}$ by 9. $5\frac{7}{8}$ by 8. $7\frac{3}{8}$ by 8.

ORAL.

1. At $\$\frac{1}{2}$ a day for board, how many days' board may be obtained for $\$7\frac{1}{2}$?

2. If $\frac{3}{4}$ of a cord of wood cost \$6, what will 1 cord cost?

3. If $\frac{3}{4}$ of a bale of cotton cost \$30, what will 1 bale cost? How many yards of cloth at \$5 a yard will pay for the bale?

4. If $\frac{3}{4}$ of a number are 15, what is the whole number?

5. 21 is $\frac{7}{9}$ of what number?

6. If $\frac{5}{6}$ of a quire of paper cost 10 cents, what did the whole quire cost?

7. After losing $\frac{3}{4}$ of his money, how many fourths would a man have left? If he had \$12 left, how much money had he at first?

8. From $1\frac{7}{2}$ take $1\frac{3}{2}$.

9. From 1 take $\frac{2}{3}$.

10. From 1 take $\frac{7}{5}$.

11. How many quarts are there in $\frac{8}{3}$ qt.? In $\frac{2}{3}$? In $\frac{11}{3}$?

12. Change to mixed numbers: $\frac{7}{2}$, $\frac{9}{2}$, $\frac{13}{2}$, $\frac{5}{3}$, $\frac{7}{3}$, $\frac{16}{3}$, $\frac{13}{4}$, $\frac{15}{4}$, $\frac{7}{5}$, $\frac{9}{5}$, $\frac{6}{5}$, $\frac{16}{6}$, $\frac{17}{6}$, $\frac{15}{7}$, $\frac{20}{8}$, $\frac{24}{9}$, $\frac{42}{10}$.

13. How many peck baskets will it take to hold 8 qt. of peaches? 32 qt.? 28 qt.?

14. How many pounds of beef at 12¢ a pound will it take to pay for 9 qt. of cherries at 8¢ a quart?

15. At 12¢ each, how many melons can be bought for 24 cents? For 40 cents? For 50 cents?

16. What part of a number is 100% of it?

17. What is 10% of \$50? \$25? \$80?

18. What per cent of 40 is 8? Of 16 is 4? Of 12 is 6? Of 25 is 5?

19. If a horse costs \$200, how much money is lost by selling him at a loss of 10%? 20%? 50%?

20. 3×4 is $\frac{1}{7}$ of what number?

21. $\frac{1}{5}$ of 25 is $1\frac{1}{0}$ of what number?

NOTE. — If the pupils cannot read to thousandths, teach them to do so.

To divide a decimal fraction by 10, 100, etc.

$10\overline{)2.40}\ .24$

10 is not contained in 2 units. Change 2 units to tenths. 10 is contained in 24 tenths 2 tenths times and 4 tenths remaining. Change 4 tenths to hundredths. 10 is contained in 40 hundredths 4 hundredths times. Compare your answer, .24, with your dividend, 2.4. What change has been made? What short way then can you discover to divide any decimal by 10?

Divide the following numbers by 10:

1.	45.75	26.9	18.85	64.7	19.01
2.	303.4	19.09	87.07	65.05	5.15
3.	.8	.68	.9	.14	.57
4.	.90	48.12	95.19	60.2	96.09
5.	84.32	75.01	34.5	5.5	50.5
6.	48.6	5.76	5.53	86.07	25.5
7.	15.85	6.87	62.5	11.93	30.09
8.	62.40	7.37	92.46	95.78	50.63
9.	13.14	7.55	8.62	46.02	18.96
10.	24.65	.67	100.75	15.75	1.05

Divide the following numbers by 100.

11.	62.02	37.62	57.36	47.33	16.66
12.	3.52	37.75	80.06	45.08	84.63
13.	84.08	16.07	2.9	1.96	10.3
14.	15.34	65.04	9.08	16.66	18.06
15.	95.37	35.75	26.37	19.08	23.04
16.	38.5	4.05	47.62	28.7	18.92
17.	3.40	3.24	2.56	5.75	30.30
18.	32.4	1.8	82.5	62.5	4.53
19.	6.24	67.5	6.75	.67	13.5
20.	17.59	36.15	12.45	4.82	31.81

Formulate a rule for dividing a decimal by 10, 100, etc.

ORAL.

1. Make problems for each of the following:

$\frac{2}{3} \times 64$	$63 \div 7$	8×9	$100 - 36$
$8 \times 6\frac{1}{2}$	$72 \div 8$	9×6	$15 + 18$

2. A girl has to practice an hour a day. If she practices 20 min. before school, 20 min. at noon, how many minutes must she practice after school?

3. One boy has $\frac{3}{4}$ of 24 cents, another $\frac{2}{3}$ of 24 cents. Which boy has the larger sum?

4. At 16¢ a quire, what will 12 sheets of paper cost?

5. A boy picked up 64 qt. of apples. How many times could he fill a peck measure with these apples?

6. A lady had a $1 bill. How much money would she have left after buying some ribbon for 47 cents, some lace for 34 cents, and some cloth for 15 cents?

7. If you have a stick 36 ft. long, how many yard sticks can you cut from it?

8. In a bunch there are 52 bananas. How many dozen bananas are there?

9. How many more shoes will 4 yokes of oxen need than 4 spans of horses?

10. If 4 pencils cost 12 cents, what will 5 pencils cost?

11. 10 gallons are how many gallons more than 32 quarts?

12. If I can buy 25 lb. of sugar for a dollar, what will 5 lb. cost? 10 lb.?

13. Add:

$34 + 16$	$46 + 14$	$65 + 25$	$34 + 36$
$53 + 17$	$82 + 28$	$37 + 23$	$62 + 18$
$36 + 44$	$32 + 48$	$75 + 15$	$24 + 36$
$32 + 28$	$68 + 22$	$49 + 41$	$41 + 39$
$72 + 18$	$53 + 37$	$68 + 22$	$38 + 22$
$43 + 17$	$49 + 11$	$65 + 25$	$44 + 56$
$56 + 24$	$36 + 24$	$21 + 39$	$69 + 21$

To find a decimal part of a decimal or to multiply a decimal fraction by a decimal fraction.

Multiply 2.4 by .4.

$$\begin{array}{r} .2\,4 \\ \times\quad .4 \\ \hline .96 \end{array}$$

This example means find 4 tenths of 2.4. We first find $\frac{1}{10}$, as in Lesson 67. We find this to be .24. If .24 is $\frac{1}{10}$, $\frac{4}{10}$ will be 4 times .24 (Lesson 37), which is .96.

NOTE. — By this method the points before the 4 in both multiplicand and multiplier are removed, and the single point before the 2 takes their place. To change these points, as in the illustration, takes only a second of time.

1.	2.5	46.05	1.6	3.25	5.07
	.5	.4	.7	.6	.8
2.	4.8	16.04	7.25	4.03	8.15
	.9	.7	.4	.5	.8
3.	1.7	2.3	6.5	8.9	7.2
	.9	.8	.7	.6	.5
4.	.15	.12	.18	.20	.05
	.4	.3	.2	.6	.7
5.	1.05	2.06	3.07	4.08	5.09
	.5	.4	.6	.8	.7
6.	4.22	5.33	6.44	7.55	8.66
	.9	.8	.5	.6	.7
7.	.35	.76	.84	.03	.16
	.5	.6	.7	.8	.9
8.	.50	.60	.76	.05	.07
	.4	.6	.5	.7	.8

9. Formulate a rule for finding a decimal part of a decimal.

ORAL.

1. Add: $\frac{1}{2}$ and $\frac{1}{3}$. $\frac{1}{2}$ and $\frac{5}{6}$.

2. Subtract: $\frac{1}{3}$ from $\frac{8}{10}$. $\frac{1}{3}$ from $\frac{5}{6}$.

3. If 1 book costs $\$1\frac{1}{4}$, what will 8 books cost?

4. If a pound of coffee costs 32 cents, what will $\frac{3}{4}$ of a pound cost?

5. I spent \$6, which was $\frac{1}{5}$ of all my money. How much money had I?

6. 32 is $\frac{4}{5}$ of what number? 48 is $\frac{8}{9}$ of what number?

7. How much is 3 times $\frac{2}{10}$?

8. How much is 7 times $\frac{5}{100}$?

9. Change \$5 to cents.

10. Change 500 cents to dollars?

11. What part of a dollar is 50 cents? $33\frac{1}{3}$ cents? 25 cents? 20 cents? 10 cents?

12. At 25¢ a box, what will 12 boxes of berries cost?

13. At $33\frac{1}{3}$ ¢ a yard, what will 18 yd. of cloth cost?

14. At 50¢ a gallon, what will 20 gal. of molasses cost?

15. At 20¢ a dozen, what will 45 doz. eggs cost?

16. What is the cost of 27 ft. of picture cord at 10¢ a yd.?

17. How many gills in 5 pt.? In $9\frac{1}{4}$ pt.?

18. How many quarts in 7 gal.? In $8\frac{1}{2}$ gal.?

19. How many days in 12 wk. 6 da.? In 11 wk. 4 da.?

20. Find the number of cubic inches in a 3-in cube.

21. Find the number of square inches in the entire surface of a 3-inch cube.

22. How many edges has a cube? What is the length of all the edges of a 3-inch cube?

23. Multiply 25 by 10. 2.5 by 10.

24. Divide 450 by 10. 4.5 by 10.

25. If a person leaves his property, wortn \$2700, to his wife and 8 children, in equal parts, how many dollars will each have?

26. How much is $\frac{1}{7}$ of 63? 84? 140? 280? 700?

NOTE. — Be sure to change the points before multiplying.

.24 /65
/24
.9860
4.930
5.9160

To find $\frac{24}{100}$ of 24.65, we first find $\frac{1}{100}$ of it, which (Lesson 67) is .2465. If .2465 is $\frac{1}{100}$, $\frac{24}{100}$ will be 24 times .2465, which is (Lesson 37) 5.9160.

1.	64.06	70.30	80.04	86.65	80.34
	.25	.36	.47	.58	.69
2.	70.09	30.08	80.09	68.40	94.06
	.15	.26	.37	.48	.59
3.	3.94	4.50	8.60	2.45	5.42
	.26	.38	.49	.51	.62
4.	3.28	4.48	6.62	8.04	6.42
	.17	.28	.39	.41	.53
5.	.08	.03	.14	.34	.75
	.98	.87	.76	.65	.54
6.	.06	.46	.51	.63	.74
	.88	.77	.66	.55	.44
7.	1.67	1.39	3.04	2.79	4.73
	.96	.85	.74	.63	.52
8.	6.09	7.06	9.08	6.07	9.04
	.38	.75	.69	.46	.51
9.	60.94	70.68	90.09	16.07	10.96
	.63	.35	.74	.43	.65
10.	30.75	56.03	80.76	76.38	40.60
	.16	.67	.13	.39	.96

ORAL.

1. There are 27 pages in his primer, and George has read 15. How many has he yet to read to finish the primer?

2. A boy who is 14 years old, says that he is 5 years older than his younger brother, and 4 years younger than his older brother. How old are his brothers?

3. A grocer pays 40 cents for a pound of tea, and sells it for 55 cents. How much does he gain? How much would he gain on 2 lb. of tea at the same rate?

4. John has 40 plums, and gives $\frac{1}{4}$ of them to Nellie.

5. I paid 7 cents for 1 cake, 7 cents for another, and 7 cents for another. Find in two ways how many cents I paid out.

6. How much more is 4 plus 3 minus 2, than 2 plus 8 minus 6?

7. A storekeeper sold 15 pairs of shoes Monday, 9 Tuesday, 7 Wednesday, 11 Thursday.

8. What will be paid for $\frac{1}{8}$ of a yard of ribbon at 4¢ a yard?

9. If there are 31 gal. of oil in a barrel, how many gallons will there be after 11 gal. are sold?

10. If a family use a gallon of milk a day, how many quarts do they use in a week?

11. How many marbles will Mr. Smith have to buy to give a dozen to each of his 4 boys?

12. Louis has 9 doves, and John has 5 times as many. How many have both boys?

13.

$\frac{1}{4}$ of 24	$\frac{2}{4}$ of 24	$\frac{1}{2}$ of 24	$\frac{3}{4}$ of 24
$\frac{4}{4}$ of 24	$\frac{2}{2}$ of 24	$\frac{2}{3}$ of 24	$\frac{1}{3}$ of 24
$\frac{1}{6}$ of 24	$\frac{2}{6}$ of 24	$\frac{3}{6}$ of 24	$\frac{4}{6}$ of 24
$\frac{5}{6}$ of 24	$\frac{6}{6}$ of 24	$\frac{1}{8}$ of 24	$\frac{3}{8}$ of 24

14. If $\frac{1}{7}$ of the 280 pupils of a school are absent, how many are absent? How many are present?

15. How much is $\frac{3}{4}$ of 12? $\frac{4}{5}$ of 10? $\frac{3}{5}$ of 20?

16. How much is $\frac{5}{6}$ of 18? $\frac{2}{7}$ of 21? $\frac{4}{7}$ of 35?

	12
$12\frac{1}{2}$	6
$6\frac{2}{3}$	8
$8\frac{1}{4}$	3
$15\frac{5}{6}$	10
$2\frac{1}{3}$	4
43	$\frac{31}{12} = 2\frac{7}{12}$
$2\frac{7}{12}$	
$45\frac{7}{12}$	

1. Add $12\frac{1}{2}$, $6\frac{2}{3}$, $8\frac{1}{4}$, $15\frac{5}{6}$, $2\frac{1}{3}$.

NOTE. — Instead of writing the common denominator, 12, with each fraction, we place it above, and only write the numerators. The same method can be used in subtraction.

2. Subtract:

$8\frac{1}{4}$	$23\frac{1}{2}$	$34\frac{2}{3}$	$16\frac{1}{3}$	$21\frac{1}{4}$
$5\frac{1}{2}$	$5\frac{3}{4}$	$27\frac{1}{3}$	$8\frac{1}{2}$	$9\frac{3}{4}$

3. From a piece of cloth containing $17\frac{1}{2}$ yd., $5\frac{3}{4}$ yd. and $4\frac{2}{3}$ yd. were sold. How many yards were left?

4. A merchant sold $17\frac{3}{4}$ yd. of muslin, $14\frac{1}{2}$ yd. of silk, and as many yards of calico as of the other two together. How many yards did he sell in all?

5. Divide 6273 by 9.

6. Add: \$8.34, \$40.39, \$638.27, \$594.38, \$1.97.

7. Find the cost of the following: 486 bu. wheat @ \$1.04 a bushel.

8. 208 sheep @ \$4.65 a head.

9. 984 bu. onions @ \$1.09 a bushel.

10. 809 tons of hay @ \$11.45 a ton.

11. 208 lb. of coffee @ 28¢ a pound.

12. 11 sheep @ \$7.47 each.

13. Change 15 bu. 4 pk. to pecks.

14. Change 1494 min. to hours.

15. Multiply 27.13 by .67.

16. Reduce 27 ft. 8 in. to inches.

17. If 3 fourths of an acre of land cost \$108, what will 1 fourth cost? What will the whole acre cost?

18. From .96 take .35.

19. Multiply:

609.4	706.8	900.9	160.7	109.6
.63	.35	.74	.43	.19

ORAL.

1. Having 27 apples, I sold $\frac{2}{3}$ of them. How many did I have left?

2. I had 24 peaches, and gave $\frac{1}{2}$ of them to Grace and $\frac{1}{3}$ to Nellie. How many did I have left?

3. A boy had 36 chickens. He sold $\frac{1}{2}$ of them, and a cat killed $\frac{1}{3}$. How many remained?

4. Susan's age is 24 years, and her sister is $\frac{2}{3}$ as old. How old is her sister?

5. 6 eighths of 64 are how many?

6. What are $\frac{3}{7}$ of 14? Of 35? 49? 28?

7. What are 4 ninths of 9? 36? 54? 81?

8. John had a melon, and gave $\frac{2}{7}$ of it to Mary and $\frac{5}{7}$ to Harry. What part of the whole melon did he give away?

9. What is the cost of 11 bbl. of flour at the rate of 5 bbl. for \$30?

10. What are 10 oranges worth, if 8 oranges are worth 16¢?

11. What will 1 box of soap cost, if $\frac{3}{4}$ of a box cost \$6?

12. If \$10 will buy $\frac{5}{6}$ of a ton of hay, what will 1 ton cost? 5 tons?

13. 9 is $\frac{1}{5}$ of what number? 7 is $\frac{1}{9}$ of what number?

14. 9 is $\frac{1}{3}$ of what number? 11 is $\frac{1}{4}$ of what number?

15. George has 20 marbles, which is $\frac{1}{4}$ of John's. How many has John?

16. If 4 yd. of cloth cost \$10, what will 8 yd. cost?

17. If 5 pairs of shoes cost \$9, what will 20 pairs cost?

18. What is $\frac{1}{5}$ of 5? $\frac{1}{4}$ of 6?

19. What is $\frac{1}{7}$ of 9? $\frac{1}{8}$ of 20?

20. A man bought a watch for \$20, and sold it for \$25. How many dollars did he gain? What part of the cost did he gain? What per cent did he gain?

21. A grocer is putting up cloves in packages of $\frac{1}{4}$ of a pound each. If he uses $7\frac{1}{4}$ lb., how many packages has he?

To find a fractional part of an integer, or to multiply an integer by a fraction.

Multiply 6 by $\frac{2}{3}$. This example means find $\frac{2}{3}$ of 6. What $\frac{1}{3}$ of $6 = 2$. is $\frac{1}{3}$ of 6? If $\frac{1}{3}$ equals 2, what will $\frac{2}{3}$ $\frac{2}{3} = 2 \times 2 = 4$. equal?

Multiply:

1.	12 by $\frac{3}{4}$.	42 by $\frac{4}{7}$.	72 by $\frac{7}{12}$.	63 by $\frac{4}{7}$.
	8 by $\frac{3}{4}$.	16 by $\frac{5}{8}$.	40 by $\frac{5}{8}$.	60 by $\frac{7}{12}$.
	9 by $\frac{2}{3}$.	60 by $\frac{3}{10}$.	24 by $\frac{5}{6}$.	28 by $\frac{3}{7}$.
2.	16 by $\frac{3}{4}$.	42 by $\frac{5}{7}$.	63 by $\frac{5}{9}$.	32 by $\frac{7}{8}$.
	50 by $\frac{4}{5}$.	56 by $\frac{3}{7}$.	84 by $\frac{7}{12}$.	45 by $\frac{2}{9}$.
	42 by $\frac{5}{6}$.	56 by $\frac{7}{8}$.	99 by $\frac{7}{11}$.	36 by $\frac{5}{6}$.
3.	54 by $\frac{7}{9}$.	64 by $\frac{5}{8}$.	63 by $\frac{7}{9}$.	49 by $\frac{5}{7}$.
	66 by $\frac{5}{11}$.	42 by $\frac{6}{7}$.	56 by $\frac{5}{8}$.	33 by $\frac{2}{11}$.
	72 by $\frac{5}{8}$.	84 by $\frac{7}{12}$.	90 by $\frac{7}{10}$.	42 by $\frac{4}{7}$.
4.	77 by $\frac{6}{7}$.	45 by $\frac{5}{9}$.	64 by $\frac{7}{8}$.	35 by $\frac{4}{5}$.
	25 by $\frac{3}{5}$.	80 by $\frac{9}{10}$.	96 by $\frac{5}{12}$.	45 by $\frac{3}{8}$.
	16 by $\frac{5}{8}$.	27 by $\frac{4}{9}$.	35 by $\frac{3}{5}$.	72 by $\frac{7}{9}$.
5.	$\frac{3}{4}$ by 4.	$\frac{1}{14}$ by 7.	$\frac{7}{9}$ by 6.	$\frac{3}{10}$ by 5.
	$\frac{3}{4}$ by 8.	$\frac{5}{6}$ by 6.	$\frac{1}{2}$ by 12.	$\frac{5}{6}$ by 3.
	$\frac{3}{10}$ by 5.	$\frac{7}{12}$ by 6.	$\frac{3}{4}$ by 12.	$\frac{5}{8}$ by 8.

NOTE. — See Lesson 15.

6.	$8\frac{1}{2}$ by 4.	$3\frac{1}{4}$ by 8.	$4\frac{1}{2}$ by 6.	$2\frac{1}{4}$ by 8.
	$7\frac{1}{4}$ by 4.	$8\frac{3}{5}$ by 5.	$9\frac{3}{4}$ by 12.	$3\frac{2}{3}$ by 9.
	$12\frac{3}{8}$ by 8.	$8\frac{1}{2}$ by 10.	$5\frac{3}{4}$ by 8.	$14\frac{2}{3}$ by 9.
7.	12 by $6\frac{1}{4}$.	18 by $4\frac{1}{2}$.	10 by $6\frac{4}{5}$.	18 by $5\frac{2}{3}$.
	16 by $7\frac{3}{4}$.	12 by $8\frac{5}{6}$.	12 by $3\frac{2}{3}$.	15 by $6\frac{2}{3}$.
	12 by $15\frac{5}{6}$.	24 by $15\frac{3}{4}$.	16 by $18\frac{3}{8}$.	20 by $18\frac{7}{10}$.

ORAL.

1. Find $\frac{1}{6}$ of \$48. Of 42 dimes. 54 cents. 72 horses.

2. Find $\frac{1}{3}$ of 30 lemons. Of 18 days. 12 trees. 15 books.

3. I went to the store with 36 cents, and spent all but 30 cents. What part of my money did I spend?

4. If John paid \$8 for a vest, and 3 times as much for a coat, how much did he pay for both?

5. $\frac{1}{7}$ of 35 weeks? 49 hours? 28 months? 63 days?

6. George is $\frac{1}{7}$ of 77 years old.

7. A boy was asked how many marbles he had, and replied, "This morning I had 8 times as many as I now have, and I had 96 then." How many has he?

8. If I should sell 12 bbl. of flour, worth \$6 a bbl., for \$69, how many dollars should I lose?

9. Bessie's grandfather is 81 years old, and she is $\frac{1}{3}$ as old. How old is Bessie? In how many years will she be 18 years old?

10. 3 is what part of 3? Of 6? 9? 12? 15? 30?

11. 3 is what per cent of 3? Of 6? 9? 12? 15? 30?

12. Find the cost of $\frac{1}{11}$ of 66 cows at \$20 each.

13. A man kept 15 sheep in one field, 9 in another, 8 in a third, and 7 in a fourth. How many sheep did he have?

14. Add 36, and 10, and 4, and 10, and 2, and 8.

15. Add 36, and 14, and 12, and 8.

16. Add:

$50 + 80 + 30 = ?$	$10 + 90 + 50 = ?$	$20 + 40 + 60 = ?$
$40 + 80 + 20 = ?$	$80 + 40 + 10 = ?$	$80 + 30 + 40 = ?$
$\underline{60} + \underline{20} + \underline{80} = ?$	$\underline{60} + \underline{10} + \underline{70} = ?$	$\underline{60} + \underline{70} + \underline{50} = ?$

17. A farmer had 24 cows, and $\frac{3}{4}$ as many sheep. How many more cows than sheep had he?

18. How much is 11 times 3 less $\frac{1}{8}$ of 40?

19. How much is 7 times 4 less $\frac{3}{4}$ of twice 8?

Application of Lessons 15 and 75.

1. At $\frac{3}{5}$ of a cent each, what will 15 apples cost?
2. At $\$\frac{3}{4}$ a pound, what will 12 lb. of nutmegs cost?
3. At $\$\frac{5}{8}$ a basket, what is the cost of 16 baskets of peaches?
4. At $6\frac{1}{4}¢$ each, what will 9 pencils cost?
5. What is the cost of 8 doz. eggs at $12\frac{1}{4}¢$ a dozen?
6. If a man can walk 30 miles in a day, how far can he walk in $\frac{7}{8}$ of a day?
7. What will $4\frac{1}{4}$ yd. of edging cost at $12¢$ a yard?
8. What is the cost of $9\frac{1}{4}$ lb. of cheese at $12¢$ a pound?
9. What is the cost of $8\frac{1}{2}$ qt. of cherries at $12¢$ a quart?
10. What will $15\frac{1}{2}$ doz. eggs cost at $20¢$ a dozen?
11. A lady bought 12 yd. of muslin at $8\frac{1}{2}¢$ a yard.
12. How much must I pay for 20 melons at $15\frac{1}{2}¢$ each?
13. If a man earns $\$9\frac{3}{4}$ a week, how mueh will he earn in 5 weeks?
14. What will 12 bbl. of vinegar cost at $\$4\frac{3}{4}$ a barrel?
15. If a horse eats $2\frac{1}{2}$ bu. of grain in a week, how many bushels will he eat in 16 weeks?
16. If a man travels $8\frac{1}{2}$ miles an hour, how far will he travel in 12 hours?
17. What will 8 cords of wood cost at $\$5\frac{1}{2}$ a cord?
18. What is the cost of 8 hats at $\$5\frac{3}{4}$ each?
19. If a basket of peaches is worth 75 cents, what is $\frac{4}{5}$ of a basket worth?
20. Find the cost of 16 yd. of cloth at $\$\frac{3}{4}$ a yard.
21. Find the area of a floor 12 ft. long and $8\frac{3}{4}$ ft. wide.
22. Find the cost of 20 yd. of cloth at $\$\frac{3}{8}$ a yard.
23. Find the cost of 16 yd. of cloth at $\$2\frac{1}{2}$ a yard.
24. What is the cost of 24 cd. of wood at $\$5\frac{3}{4}$ a cord?
25. What will 64 doz. eggs cost at $28\frac{1}{2}¢$ a dozen?
26. What will 40 cows cost at an average of $\$28\frac{3}{4}$ a head?
27. What is the cost of 18 stoves at $\$33\frac{1}{3}$ each?

ORAL.

1. If chestnuts are bought at 8 cents a quart, and sold at 12 cents, what is the gain per cent?

2. If pineapples are bought for 12 cents each, and sold for 16 cents, what per cent is gained?

3. 80, 40, and 60 are 10% of what numbers?

4. 100, 80, and 400 are 50% of what numbers?

5. The width of a rectangular field is 40 rods, which is 25% of the length. How long is the field?

6. A hat which cost \$3 is sold for \$4. What is the per cent of the gain?

7. What part of 12 is 4? Of 60 is 12?

8. What per cent of 12 is 4? Of 60 is 12?

9. How many square inches in a rectangular surface which is 9 in. by 12 in.?

10. How many square inches are there in a triangular surface whose base is 12 in. and whose height is 8 in.?

11. If $\frac{5}{8}$ of a yard of ribbon cost 25 cents, what will $\frac{1}{8}$ of a yard cost? What will $\frac{1}{4}$ of a yard cost?

12. Mary divided $\frac{3}{4}$ of a yard of ribbon equally among 3 girls. What part of a yard did each girl receive?

13. Multiply: $\frac{2}{3}$ by 6. $\frac{3}{5}$ by 10. $\frac{3}{4}$ by 8. $\frac{7}{8}$ by 4.
$\frac{8}{9}$ by 3. $\frac{2}{11}$ by 7. $\frac{3}{4}$ by 2. $\frac{5}{6}$ by 6.

14. A man bought a horse for \$64. If he paid $\frac{5}{8}$ of the cost, how much does he still owe?

15. If 9 yd. of muslin cost \$1.08, what will 7 yd. cost?

16. 9×7, plus 9, divided by 12, is what part of 36?

17. If 7 yd. of ribbon cost \$2.80, what will 2 yd. cost?

18. $\frac{3}{7}$ of 21 and $\frac{3}{8}$ of 40 are how many?

19. A colt was bought for \$60, and sold for $1\frac{1}{3}$ times its cost.

20. How many days in $33\frac{1}{3}\%$ of the month of April?

21. If you buy for \$12 and sell for \$15, what per cent do you gain?

MULTIPLICATION.

456	456 × 7	3192
237	456 × 30	13680
3192	456 × 200	91200
13680	456 × 237 =	108072
91200		
108072		

NOTE. — Let the pupils omit the unnecessary ciphers as soon as possible.

Multiply:

1.	437 by 679	628 by 423	332 by 434
	904 by 485	321 by 391	434 by 678
	935 by 429	648 by 346	725 by 642
	539 by 732	871 by 735	802 by 724
2.	484 by 424	743 by 355	706 by 546
	620 by 912	168 by 218	904 by 867
	471 by 168	830 by 577	514 by 474
	617 by 433	605 by 768	812 by 357
3.	625 by 339	743 by 657	561 by 457
	237 by 195	387 by 235	518 by 546
	608 by 768	482 by 135	629 by 387
	257 by 246	372 by 274	348 by 523
4.	418 by 625	437 by 434	297 by 824
	408 by 316	621 by 297	792 by 382
	683 by 672	763 by 468	719 by 338
	811 by 725	234 by 496	563 by 678
5.	1621 by 457	5682 by 543	9238 by 858
	1763 by 468	2573 by 761	7779 by 827
	1234 by 496	3871 by 873	9787 by 558
	4185 by 368	5482 by 135	7601 by 759

ORAL.

1. 40 are how many tens?

2. $\frac{1}{2}$ of 20 are how many tens?

3. $1\frac{1}{2}$ times 40 are how many tens?

4. How many half-dozen in 36?

5. Is 30 an odd number or an even number?

6. What two numbers multiplied together make 30?

7. At 4¢ a pint what will a gallon of vinegar cost?

8. What is the cost of 5 yd. of tape at 2¢ a foot? At $2\frac{1}{2}$¢?

9. How many cents in 4 dimes? In 2 dimes? In $1\frac{1}{2}$ dimes?

10. How many dimes in a dollar? In a half-dollar? In a quarter-dollar?

11. How many days from the tenth of May to the first of June?

12. How many days from the 10th of April to the 1st of May?

13. How many days from the 1st of June to the 10th of July?

14.

$\frac{1}{2}$ of 48	$\frac{1}{4}$ of 48	$\frac{3}{4}$ of 48	$\frac{1}{3}$ of 48
$\frac{2}{2}$ of 48	$\frac{2}{4}$ of 48	$\frac{4}{4}$ of 48	$\frac{1}{6}$ of 48
$\frac{2}{6}$ of 48	$\frac{3}{6}$ of 48	$\frac{4}{6}$ of 48	$\frac{5}{6}$ of 48
$\frac{6}{6}$ of 48	$\frac{1}{8}$ of 48	$\frac{2}{8}$ of 48	$\frac{3}{8}$ of 48
$\frac{4}{8}$ of 48	$\frac{5}{8}$ of 48	$\frac{6}{8}$ of 48	$\frac{7}{8}$ of 48
$\frac{1}{12}$ of 48	$\frac{3}{12}$ of 48	$\frac{6}{12}$ of 48	$\frac{8}{12}$ of 48

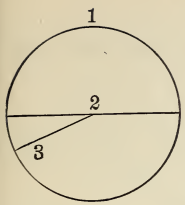
15. How many weeks in 50 days?

16. How many weeks in 50 school-days.

17. 30 min. is what part of an hour? 15 min. is what part?

18. If you have a box 4 in. long, 3 in. wide, and 2 in. deep, how many inch cubical blocks can you put on the bottom of the box? How many layers can you put in the box? How many blocks can you put in?

19. I bought 9 yd. of ribbon for 63 cents. How much was it a yard?



1. What is this figure called?
2. What is the line (1) called?
3. What is the line (2) called?
4. What is the line (3) called?

Ans. Radius.

5. What part of the diameter is the radius?
6. Can you have more than one diameter in a circle?

7. Draw a circle. Draw two diameters at right angles to each other. Into how many parts does it divide the circle?

8. Can one circle have more than one radius?

9. Draw a circle on the board with a string 6 in. long for your radius. How long is your diameter?

10. Take a string 12 in. long (the length of your diameter), and see how many times you can use it to measure your circumference.

11. How many times the diameter is the circumference? It is about $3\frac{1}{7}$ times.

12. From what you have just learned, tell how to find the circumference when the diameter is given.

13. If the path through the middle of a circular flower-bed is 14 ft., what is the length of a path round the outside?

14. If a circular pond is 28 ft. in diameter, what is its circumference?

15. If a park in the form of a circle is 35 rods across, how many rods is it round it?

16. If a plate is 7 in. across, how far is it round it?

17. If the diameter of the large wheel of an engine is 21 ft., what is its circumference?

18. Find the circumference when the following diameters are given:

84 ft.	98 yd.	140 ft.	210 yd.
105 rd.	70 ft.	280 yd.	56 ft.

ORAL.

1. If it takes $\frac{1}{6}$ of a yard of ribbon for a loop, how many loops will $\frac{1}{3}$ of a yard of ribbon make?

2. $\frac{1}{5}$ equals how many tenths?

3. If you have a half of a quire of paper, how many sixths of a quire have you? How many twelfths of a quire?

4. In 5 pounds, how many thirds of a pound?

5. In three yards, how many sevenths of a yard?

6. If I buy $\frac{1}{2}$ of a pound of one kind of candy, and $\frac{1}{8}$ of a pound of another kind, how many eighths of a pound do I buy?

7. If I buy $\frac{1}{2}$ of a yard of velvet, and then $\frac{1}{6}$ of a yard, how many sixths of a yard do I buy?

8. Charles had \$30, and spent $\frac{1}{2}$ of it for a watch, and $\frac{1}{10}$ of it for a pair of shoes. How many tenths did he spend? How many dollars did he spend?

9. How many yards is it $\frac{1}{2}$ way round a flower bed which measures 15 ft. on each side, and 9 ft. on each end?

10. If a flower bed is $\frac{1}{4}$ of a rod on one side, and $\frac{1}{12}$ of a rod on the other side, how many twelfths is it on both sides? How many thirds is it?

11. Into how many piles do I put 96 oranges, if I put a dozen in each pile?

12. A man made a fence across a garden that is 12 yards wide. If he put in posts 2 yards apart to support the railing, how many posts did he use, provided there was a post at each end?

13. How many square yards in a square that is three yards on a side?

14. 4 times 6 eighths are how many whole ones?

15. 8 is $\frac{1}{2}$ of what number? 50% of what number?

16. 6 is $\frac{1}{5}$ of ——. $3\frac{1}{3}$ is $\frac{1}{3}$ of ——. $2\frac{1}{2}$ is $\frac{1}{4}$ of ——.
8 is $\frac{1}{8}$ of ——. 6 is $\frac{1}{9}$ of ——. $4\frac{1}{4}$ is $\frac{1}{8}$ of ——.
9 is $\frac{1}{12}$ of ——. 4 is $\frac{1}{7}$ of ——. $1\frac{1}{2}$ is $\frac{1}{6}$ of ——.

1. A man sold his horse for $375, and thus gained $75. What was the cost of the horse?

2. Divide 615 by 15, and multiply the quotient by 25.

3. A farmer purchased 125 cows for $3125. How much did each cow cost?

4. A horse is sold for $200.50, some cows for $250.63, two yokes of oxen for $300.38, and a carriage for $160. What is the value of the whole?

5. Bought some tea for $111.75, and sold it for $152.35. How much did I gain?

6. If 1 yd. of cloth costs $5.25, what will 236 yd. cost?

7. Bought 658 bu. of salt at $1.05 a bushel.

8. A grocer sold 75 cans of tomatoes for $31.50.

9. Change $\frac{3}{4}$ to 8ths; $\frac{5}{6}$ to 12ths; $\frac{2}{5}$ to 10ths.

10. In $\frac{7}{4}$ of a yard, how many yards?

11. Find the sum of $1\frac{3}{2}$ and $\frac{5}{6}$.

12. Add $19\frac{1}{2}$, $20\frac{1}{3}$, $21\frac{1}{4}$, $22\frac{2}{3}$.

13. Add $5\frac{1}{4}$ in., $4\frac{3}{4}$ in., $2\frac{1}{8}$ in., and $9\frac{3}{16}$ in.

14. From $18\frac{5}{6}$ take $12\frac{1}{3}$.

15. From a piece of cloth containing $27\frac{3}{4}$ yd., $18\frac{7}{8}$ yd. were taken.

16. What is the cost of 36 doz. eggs at $37\frac{1}{2}$¢ a dozen?

17. If a pair of chickens cost $\$1\frac{1}{4}$, what will 10 pairs cost?

18. If I pay 6 cents for 5 apples, what is the cost of 1 apple?

19. How far can a man walk in 26 hours at the rate of $2\frac{1}{2}$ miles an hour?

20. How many quarts of strawberries have you, if you have 2 bu. 2 pk. 2 qt.? How much are they worth at 15¢ a quart?

21. How many square feet in a floor 32 ft. long by 21 ft. wide?

22. A box is 3 ft. long, 2 ft. wide, and 1 ft. thick. How many square feet in its surface? Make a diagram.

23. Find the cubic feet in this box.

ORAL.

1. If 1 man can earn \$12 in 1 week, how many dollars can he earn in 2 weeks? In 5 weeks? In $2\frac{1}{2}$ weeks? In 3 weeks?

2. If a man can earn \$24 in 4 weeks, how much can he earn in 1 week? In 3 weeks? In 7 weeks?

3. If 6 oranges cost 18 cents, what will 4 oranges cost at the same price? 9 oranges? 11 oranges?

4. A horse that cost \$100 was sold for \$150. How many dollars was gained? What part of the cost was gained? What per cent was gained?

5. If goods that cost 75 cents a yard sell for 50 cents, how many cents are lost? What part of the cost is lost? What per cent is lost?

6. What is 25% of 8? 16? 24? 32?

7. What is 10% of 30? 50? 70? 90?

8. Find the cubic inches in a block 4 in. long, 3 in. thick, and 1 in. wide?

9. Find the cubic inches in a block 2 in. by 2 in. by 2 in.

10. Find the difference between 2 ft. square and 2 square ft.

11. How many days in 7 wk. and 3 days?

12. If you had $\frac{1}{2}$ of a dollar and should earn $\frac{1}{3}$ of a dollar, what part of a dollar would you then have?

13. $12 + 6 = ?$ $12 - 6 = ?$ $12 \times 6 = ?$ $12 \div 6 = ?$

14. $12 + 3 = ?$ $12 - 3 = ?$ $12 \times 3 = ?$ $12 \div 3 = ?$

15. $12 + 4 = ?$ $12 - 4 = ?$ $12 \times 4 = ?$ $12 \div 4 = ?$

16. $9 + 7 = ?$ $9 - 7 = ?$ $9 \times 7 = ?$ $9 \div 7 = ?$

17. $9 + 9 = ?$ $9 - 9 = ?$ $9 \times 9 = ?$ $9 \div 9 = ?$

18. 6 times 12 and $\frac{1}{6}$ of $12 = ?$

19. 8×7 and $\frac{1}{7}$ of $7 = ?$

20. 9×4 and $\frac{3}{4}$ of $4 = ?$

21. $\frac{1}{8}$ of 48 is what number?

22. 6 times $\frac{1}{3}$ of 15 are how many?

23. $\frac{1}{6}$ of Will's age is $2\frac{1}{2}$ years. How old is he?

1. Change 1456 gills to pints, then to quarts, then to gallons.

2. Change 6 mi. 113 rd. to rods.

3. I bought a coat for $12\frac{1}{4}$, a hat for $2.63, a pair of shoes for $8\frac{1}{2}$, a cane for $1.12, and a collar for 16 cents.

4. Multiply 6.18 by 2.5.

5. Divide 158.70 by .46.

6. A merchant employs an agent to collect bills amounting to $514.60. If the agent retains $\frac{1}{20}$ of the sum, how much does the merchant receive?

7. What fraction of a bushel is 16 quarts? What per cent is it?

8. A horse cost $150, and was sold at a loss of 20%. What was the loss?

9. A clerk, whose salary is $1500, pays $300 for rent. What part of his salary is that? What per cent is it?

10. A farmer sold 450 bu. of corn. If this is $33\frac{1}{3}\%$ of his entire crop, what was his entire crop?

11. A piece of cloth contained 45 yd., and from it was sold 2 suits of 15 yd. each. How many yards remained? What per cent remained?

12. The rent of my house is $200 for 5 mo. What is the rent for a year?

13. At the rate of $25 a month, what is the rent of a house for 4 years?

14. What is the circumference of a wheel whose diameter is 35 ft.?

15. What is the convex surface of a pyramid, one side of the square base being 10 ft., and the slant height 8 ft.?

16. If 12 men can do a piece of work in 17 days, how long will it take 36 men to do it?

17. If 10 gal. of wine cost $42.50, what will 63 gal. cost?

18. What is the area of a triangle whose base is 25 in. and altitude 18 in.?

ORAL.

1. If a man spends $28 in a month, what does he spend in a week?

2. If a man spends $21 in a week, what does he spend in a day?

3. If you give 5 cents for a gill of varnish, what would you give for a pint? A quart? A gallon?

4. 4 is $\frac{2}{3}$ of what number?

5. 8 is $\frac{4}{5}$ of what number?

6. 15 is $\frac{5}{8}$ of what number? 20 is $\frac{5}{3}$ of what number?

7. $2\frac{2}{5}$ is $\frac{1}{5}$ of what number? $4\frac{3}{7}$ is $\frac{1}{7}$ of what number?

8. $6\frac{5}{9}$ is $\frac{1}{9}$ of what number?

9. How can you divide 5 oranges equally among 3 persons?

10. If 4 yd. of cloth cost $2, what is that a yard?

11. A man sold a watch for $63, which was $\frac{7}{8}$ of what it cost him. How much did he gain?

12. A man paid out $4, which was $\frac{2}{3}$ of all the money he had.

13. If $\frac{2}{3}$ of a pound of coffee cost 24 cents, how much will a pound cost? How many pints of peanuts, at 6¢ a pint, can be bought for the price of a pound of coffee?

14. 24 is $\frac{2}{3}$ of how many?

15. If 2 men can do a piece of work in 6 days, how long will it take 4 men?

16. If 5 oranges cost 25¢, what will 3 oranges cost?

17. If 4 yd. of cloth cost $12, what will 2 yd. cost?

18. 24 is $\frac{8}{9}$ of what number?

19. Mrs. Smith took $3\frac{1}{2}$ doz. eggs to the store, and sold them for 20 cents a dozen. With the proceeds she bought as many pounds of sugar at 6¢ a pound as she could buy, and brought the rest of her money home. How much did she bring home?

20. $7\frac{4}{5}$ is $\frac{1}{5}$ of what number?

16 ounces 1 pound.
2000 pounds 1 ton (T.).

1. How many ounces in 8 lb. 7 oz.?
2. How many ounces in $\frac{5}{8}$ of a ton?
3. Change 3 T. 216 lb. 7 oz. to ounces.
4. Change 1 T. 425 lb. 12 oz. to ounces.

In dividing by 2000 to change pounds to tons, first divide by 1000, by moving the point to the left, and then divide by 2.

Change 7897 lb. to tons.

$$2\overline{)7.897}$$
$$3.9485$$

$$2000\overline{)7897}\quad 3 \text{ tons.}$$
$$6000$$
$$1897 \text{ lb.}$$

5. Change 117309 oz. to pounds. Change your pounds to tons.
6. Change 1375 lb. 14 oz. to ounces.
7. Change 65784 ounces to pounds and tons.
8. Change 4 T. 75 lb. 6 oz. to ounces.
9. Change 7 T. 86 lb. 8 oz. to ounces.
10. Change 1400 pounds to ounces.
11. What is the cost of 256 oz. of sugar at 9¢ a pound?
12. How many tons in 12640 lb.?
13. Reduce 6 T. 1314 lb. to pounds.
14. Reduce 64052 lb. to tons.
15. Change 3206 oz. to pounds.
16. Change 11 T. 1700 lb. 6 oz. to ounces.
17. How many pounds in 642 ounces?
18. What will 18000 lb. of hay cost at $15 a ton?
19. How many pounds are there in 5 T. 1675 lb.?
20. How many ounces in 6 T. 83 lb. 13 oz.?
21. Change 7 T. 918 lb. to pounds.
22. How many boxes, each containing 12 lb., can be filled from a hogshead containing 960 lb. of sugar?

ORAL.

Find the cost of the following:—

1. 3 lb. pork @ 15¢.
2. 4 lb. sugar @ 6¢.
3. 2 bu. potatoes @ 60¢.
4. ½ bu. corn @ 90¢.
5. 6½ lb. rice @ 8¢.
6. 1½ lb. starch @ 16¢.
7. 9 yd. calico @ 9¢.
8. 2 lb. cheese @ 14¢.
9. ⅔ doz. oranges @ 30¢.
10. 18 yd. calico @ 33⅓¢.
11. 6 lb. butter @ 40¢.
12. 8 lb. coffee @ 30¢.
13. 12 lb. fish @ 8¢.
14. 2 bu. corn @ 90¢.
15. 3½ doz. eggs @ 20¢.
16. 10 lb. sugar @ 6¢.
17. 20 yd. ribbon @ 25¢.
18. 3 qt. oil @ 20¢ a gallon.
19. 5 gal. kerosene @ 9¢.
20. 50 bu. potatoes @ 50¢.
21. Multiply 286.08 by 100.
22. Multiply 1000 by .01. By .1.
23. Multiply 4000 by .4. By .06.
24. Change to their smallest terms:

$\frac{2}{8}$, $\frac{4}{8}$, $\frac{4}{12}$, $\frac{3}{12}$, $\frac{6}{12}$, $\frac{2}{10}$, $\frac{5}{10}$, $\frac{3}{15}$, $\frac{5}{15}$, $\frac{4}{16}$.

25. Change to their smallest terms:

$\frac{6}{8}$, $\frac{9}{12}$, $\frac{10}{12}$, $\frac{8}{12}$, $\frac{6}{15}$, $\frac{12}{15}$, $\frac{9}{15}$, $\frac{6}{16}$, $\frac{10}{16}$, $\frac{12}{16}$.

26. Change to 16ths:

$\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$, $\frac{1}{8}$, $\frac{3}{8}$, $\frac{5}{8}$, $\frac{7}{8}$, 1, $2\frac{1}{2}$, $3\frac{1}{8}$.

27. Change ⅔ to equivalent fractions, having for denominators: 9, 12, 15, 27, 30, 36, 24, 18.

28. Add: $\frac{3}{8}$ and $\frac{7}{16}$ $\frac{11}{24}$ and $\frac{7}{8}$ $\frac{7}{24}$ and $\frac{5}{6}$ $\frac{11}{36}$ and $\frac{5}{9}$
$\frac{7}{12}$ and $\frac{4}{6}$ $\frac{3}{4}$ and $\frac{4}{12}$ $\frac{4}{75}$ and $\frac{4}{5}$ $\frac{12}{18}$ and $\frac{3}{6}$

29. Multiply:

$\frac{1}{3}$ by 3	$\frac{9}{10}$ by 5	$\frac{2}{3}$ by 3	$\frac{5}{12}$ by 6
$\frac{3}{4}$ by 4	$\frac{11}{15}$ by 5	$\frac{7}{8}$ by 4	$1\frac{5}{6}$ by 2
$\frac{8}{9}$ by 3	$1\frac{5}{6}$ by 3	$\frac{7}{9}$ by 3	$\frac{5}{8}$ by 4

30. Multiply:

$\frac{11}{12}$ by 6	$\frac{11}{12}$ by 6	$\frac{5}{8}$ by 8	$\frac{5}{18}$ by 9
$\frac{7}{8}$ by 9	$\frac{6}{7}$ by 7	$\frac{3}{10}$ by 5	$1\frac{1}{8}$ by 8
$1\frac{1}{6}$ by 6	$\frac{1}{2}$ by 8	$\frac{3}{4}$ by 8	$\frac{3}{8}$ by 8

1. A trader sold a house and lot for $5986, at a loss of $1954.

2. Add:

$81.50	$76.67	$98.55	$49.87
9.07	9.72	17.00	56.08
56.27	37.29	45.62	29.78
4.25	8.50	78.29	9.43
2.62	23.42	77.75	90.08
19.75	8.93	56.33	79.65
8.37	86.75	7.87	94.37
16.62	5.87	78.89	8.58

3. Bought a horse for $160, and sold it for $145.75. How much was lost?

4. If 276 men can build a wall in 137 days, how long will it take one man?

5. How much must I pay for a farm of 112.8 acres, if the price an acre is $37.50?

6. How many feet in 1287 rods?

7. A clerk's salary is $55 a month, and he pays $22 a month for board, and $9.50 a month for other expenses. How much does he save in 8 months?

8. Divide 2813 by 29. 9. Divide 3500 by 42.

10. If 56 lb. make a bushel of shelled corn, how many bushels in a load weighing 1792 lb.

11. A has 715 sheep, and B 8 times as many lacking 1914. How many sheep has B?

12. Make an example to illustrate "Several numbers given, to find their sum."

13. Reduce to improper fractions: $9\frac{5}{8}$, $3\frac{7}{9}$, $6\frac{7}{8}$, $9\frac{4}{7}$, $7\frac{5}{6}$.

14. A farmer had 4 fields containing $56\frac{1}{4}$ acres, $39\frac{7}{16}$ acres, $28\frac{5}{8}$ acres, and $47\frac{3}{4}$ acres. How many acres did he own? If he should sell $19\frac{5}{8}$ acres at one time and $28\frac{3}{4}$ acres at another, how many acres would he have left?

ORAL.

1. How many square yards in the floor of your schoolroom?

2. If you have 720 in. of wire, into how many foot pieces can you cut it?

3. How many yards of wire fencing will it take to reach round my rectangular flower garden, 8 yd. by 3 yd.?

4. I cut 12 in. from a piece of ribbon 1 yd. long. How many feet in the piece that is left?

5. A strip of oilcloth is 3 ft. 8 in. long. How many inches long is it?

How many:

6. Inches in 1 ft.? 2 ft.? 4 ft.?

7. Feet in 1 yd.? 3 yd.? 5 yd.?

8. Inches in 1 yd.? $\frac{1}{2}$ yd.? $\frac{1}{4}$ yd.?

9. Feet in 12 in.? 36 in.? 60 in.?

10. Yards in 3 ft.? 9 ft.? 15 ft.?

11. Yards in 36 in.? 18 in.? 9 in.?

12. Yards in 1 rod? 2 rd.? 3 rd.?

13. Feet in 1 rd.? 2 rd.? 3 rd.?

14. Rods in 1 mi.? $\frac{1}{2}$ mi.? $\frac{1}{4}$ mi.?

15. A box contains sixty oranges. How many dozen? They sold for 5¢ a half-dozen. How much was received for all?

16. Out of every dozen lemons 2 have spoiled. How many have spoiled out of 72 lemons?

17. How many sheets of paper are there in $\frac{1}{2}$ quire? $\frac{1}{3}$ quire? $\frac{1}{4}$ quire? $\frac{1}{6}$ quire?

18. If you had 64 pints of currants, how many quarts would you have? How many peck baskets could you fill?

19. How many pecks of beans in 56 quarts?

20. I had 1 bu. of apples. I sold 8 quarts. How many pecks remained?

21. Fannie bought a pound of sugar, but on her way home spilled $\frac{1}{4}$ of it. How many ounces had she left?

1. Multiply: $\frac{7}{8}$ by 4. 9 by $\frac{5}{12}$. 27 by $5\frac{2}{3}$. $\frac{11}{18}$ by 9. $1\frac{1}{2}$ by 8. $2\frac{3}{7}$ by 14. 7 by $1\frac{3}{7}$. 22 by $\frac{9}{11}$.

2. Mr. Brown has 4 pieces of velvet. The first contains $7\frac{3}{4}$ yd., the second $8\frac{3}{4}$ yd., the third $5\frac{7}{16}$ yd., and the fourth $8\frac{1}{2}$ yd.

3. What is the cost of $6\frac{1}{4}$ gal. of molasses at \$.40 a gallon?

4. How many feet are there in 250 rods?

5. What will 52 tons of coal cost at \$6.25 per ton?

6. What is the cost of 25 bbl. of salt at \$3.25 a barrel?

7. How many square feet in a floor 25 ft. by 18 ft.?

8. Find the circumference of a circle 21 in. in diameter.

9. How many cubic feet in a block 19 ft. by 17 ft. by 15 ft.?

10. A's farm contains 320 acres, B's farm 25% more. How many acres are there in B's farm?

11. How many square feet of cloth will it take to cover the top of a desk 4 ft. 4 in. long and 3 ft. wide?

12. How many yards of fence will it take to enclose a lot 180 ft. long and 120 ft. wide?

13. What is the difference between 6 dozen dozen and half a dozen dozen?

14. I can buy half a peck of apples for 15 cents. At that rate what shall I pay for 3 bu.?

15. From a barrel of oil containing 35 gal. 15 gal. were used. What is the remainder worth at 18 cents a gallon?

16. Add: \$38.75, \$6.07, \$8094.16, \$238.74, \$74.83, \$489.62, \$.82, \$780, \$54.86, \$3.90, \$42.86, \$95.08, \$16.98, \$438.

17. I bought 864 bbl. of flour at \$5.75 a barrel. After I had paid \$2684.15 of the bill, how much did I still owe for the flour?

18. In making some boxes a carpenter used $4\frac{1}{2}$ lb. of board nails, $1\frac{1}{2}$ lb. of shingle nails, and $6\frac{2}{3}$ lb. of lath nails. How many pounds did he use in all?

19. In 4,276 lb., there are how many tons?

20. How many tons are there in 51,570 pounds?

21. How many ounces are there in 5 lb. 8 oz.?

ORAL.

1. Give sums:

$57 + 16$	$49 + 18$	$67 + 27$	$75 + 14$	$58 + 18$
$13 + 78$	$17 + 43$	$14 + 36$	$18 + 56$	$17 + 45$
$25 + 17$	$66 + 14$	$16 + 26$	$48 + 12$	$34 + 19$
$18 + 25$	$14 + 17$	$12 + 31$	$27 + 16$	$17 + 27$

2. Give differences:

$66 - 17$	$31 - 25$	$85 - 50$	$67 - 18$	$42 - 29$
$54 - 36$	$87 - 19$	$50 - 14$	$45 - 36$	$36 - 12$
$60 - 15$	$66 - 48$	$84 - 56$	$37 - 14$	$81 - 58$
$46 - 37$	$75 - 15$	$70 - 18$	$74 - 57$	$83 - 28$

3. Give products:

14×4	6×15	14×6	8×71	17×4
18×6	3×19	21×7	6×13	16×6
24×4	5×15	70×7	6×15	13×6
15×2	4×21	12×8	5×17	15×4

4. Give quotients:

$45 \div 3$	$42 \div 7$	$76 \div 4$	$60 \div 4$	$108 \div 6$
$98 \div 7$	$75 \div 5$	$112 \div 7$	$92 \div 4$	$96 \div 4$
$56 \div 8$	$98 \div 4$	$70 \div 5$	$78 \div 3$	$91 \div 7$
$90 \div 6$	$80 \div 5$	$48 \div 3$	$56 \div 4$	$144 \div 9$

5. Give remainders:

$24\frac{3}{4} - 4\frac{1}{4}$	$60 - \frac{1}{2}$	$40 - \frac{1}{4}$	$16 - \frac{1}{2}$
$50 - 2\frac{1}{2}$	$40 - 5\frac{3}{4}$	$30 - 2\frac{1}{2}$	$22 - 1\frac{3}{4}$
$4\frac{3}{4} - 2\frac{1}{6}$	$6\frac{1}{2} - 1\frac{1}{4}$	$7\frac{1}{3} - 1\frac{1}{9}$	$8\frac{1}{3} - 6\frac{1}{6}$
$11\frac{3}{4} - 7\frac{1}{2}$	$24 - 1\frac{1}{4}$	$21 - 10\frac{1}{2}$	$9\frac{5}{6} - 1\frac{2}{3}$

6. $46 + 20 + 30 - 10 - 30 + 40 + 10 - 80 + 40 - 50.$
$82 - 40 - 30 + 50 + 20 - 40 - 10 + 20 + 30 - 40.$
$49 + 30 - 20 + 40 - 50 + 60 - 40 - 10 + 30 + 20.$
$15 + 20 + 30 - 40 + 50 - 20 + 30 - 60 - 10 + 60.$
$42 - 30 + 60 - 30 - 30 + 50 + 30 - 40 - 30 + 20.$

TO DIVIDE A DECIMAL BY A DECIMAL.

1. Divide 24 by 4.

2. Multiply both divisor and dividend by 10, and then divide.

3. Multiply both divisor and dividend by 100, and then divide.

4. How do your quotients compare in the three examples?

5. What effect on the quotient if you multiply both divisor and dividend by the same number?

Divide 2.44 by .4.

$$\begin{array}{r} .4\overline{)2.44} \\ 4\overline{)24.4} \\ \hline 6.1 \end{array}$$

Since multiplying both divisor and dividend by the same number does not affect the quotient, we multiply both by 10. We are now to divide 24.4 by 4. 4 is contained in 24 units 6 units times. 4 is contained in 4 tenths 1 tenth times.

NOTE. — Always multiply both dividend and divisor by that number which will change the divisor to a whole number.

6.

6.48 by .6	.36 by .09	12.8 by 1.6	9.52 by .7
9.08 by .2	.49 by .7	300 by .06	6.75 by .15
1.44 by .06	.96 by .08	7.2 by 1.2	9.52 by 4.76
3.28 by .4	6.4 by .08	14.4 by 1.2	3.24 by .09

7.

144 by .12	25.6 by 1.6	.8 by 1.6	412.5 by .33
10.8 by .09	17.28 by 1.44	7.2 by 120	5.20 by .65
12.6 by .21	8.4 by .14	17.50 by .25	2.60 by .03
3.05 by .5	18.06 by .06	180.6 by .06	4.64 by .04

8.

3.3 by .2	1.23 by .5	3.06 by .09	5.4 by .18
8.07 by .02	70.2 by .09	10 by .05	1.60 by .8
1.8 by .20	60.4 by .08	18.03 by .03	14 by .07
71.04 by .07	.6 by .12	3 by 1.2	8.48 by .04
40.8 by 1.6	.05 by .25	1.08 by 1.2	9.60 by 3.2

ORAL.

1. 15×100 65×100 98×100 23×100
34×100 67×100 78×100 61×100
29×100 41×100 72×100 96×100
45×100 79×100 89×100 92×100

2. A woman buys 3 lb. of butter at 30¢ a pound, and gives the grocer a 50-cent piece. How much more must she pay?

3. A man owns a farm of $\frac{3}{4}$ of 80 acres. How much has he left after selling 40 acres?

4. What is the cost of 4 pieces of silk, 20 yd. in a piece, at 50 ct. a yard?

5. A girl had 80 cents. She bought a doll for 40 cents, and spent the rest for candy at 20¢ a pound. How many pounds did she buy?

6. If sugar costs 4¢ a pound, what is the cost of 21 pounds?

7. If vinegar is 20¢ a gallon, how many quarts can I get for 15 cents?

8. By selling a lot for \$600, I lost \$200.

9. What is the cost of 16 lb. of meat at 25¢ a pound?

10. What is the cost of 30 doz. lemons at $33\frac{1}{3}$¢ a dozen?

11. What is the cost of 400 yd. of velvet at 50¢ a yard?

12. If a man receives \$800 for 4 horses, sold at the same price, how much does he receive for 1 horse?

13. Add 5 ft. 6 in. and 3 ft. 6 in.

14. If meat costs 16¢ a pound, what is the cost of 1 pound 7 ounces?

15. A farmer sold 48 doz. eggs at 25¢ a dozen.

16. What is the cost of 4 pairs of shoes at $\$3\frac{1}{2}$ a pair?

17. If tea costs 80 cents a pound, how much does a pound and three-quarters cost?

18. $1\frac{1}{2} + \frac{1}{2}$. $1\frac{1}{2} + 2\frac{1}{2}$. $1\frac{3}{4} + \frac{1}{4}$. $2\frac{1}{4} + 3\frac{1}{2}$.
$1\frac{1}{2} + 1\frac{1}{2}$. $2\frac{1}{2} + 2\frac{1}{2}$. $3\frac{1}{2} + 1\frac{1}{4}$. $3\frac{1}{4} + 3\frac{1}{2}$.

1. A merchant bought at one time 224 bbl. of flour for $1344; at another 217 bbl. for $1193.50; at another 192 bbl. for $1056; at another 486 bbl. for $2916. How many barrels did he buy? What was the cost of all?

2. If a railway train runs 42 miles an hour, how many miles will it run in 678 hours?

3. A farmer sold his wheat at 97¢ a bushel, receiving $351.14. How many bushels did he sell?

4. If 63 books cost $126, what will 125 books cost?

5. If 24 men can dig a ditch in 18 days, how many days will it take 1 man? How many men will it take to dig it in 27 days?

6. Multiply $10\frac{3}{11}$ by 33.

7. Multiply 45 by $1\frac{1}{5}$.

8. If 97 books cost $317.19, what does each book cost?

9. What is the cost of 480 pounds of tea at $62\frac{1}{2}$ cents a pound?

10. What is the cost of 2480 articles at 75¢ each?

11. If 22 bbl. of flour cost $143.00, what is the price of a barrel?

12. How many square rods in a rectangular field 40 rods wide and 92 rods long?

13. How many square ft. in the walls and ceiling of a room 36 ft., by 48 ft., and 12 ft. high?

14. Reduce 3 gal. 3 qt. 1 pt. 2 gi. to gills.

15. Reduce 17 bu. 3 pk. 5 qt. 1 pt. to pints.

16. If 50 bu. of corn cost $20 what will 600 bu. cost?

17. If I lose $21 on an article that cost $63, what part do I lose? What per cent do I lose?

18. Find 75% of 440 sheep.

19. How many cubic feet of water are there in a rectangular cistern, whose bottom is 8 ft. on a side, if the water is 12 ft. deep?

ORAL.

1. George had 75 apples, and gave away 20% of them. How many had he left?

2. A grocer lost $100 on a cargo of fruit, which was 50% of the cost.

3. If 6 oranges cost 24 cents, what will eight oranges cost at the same rate?

4. If 9 pears cost 27 cents, what will 12 pears cost at the same rate?

5. If 3 bbl. of flour are worth $18, what are 7 bbl. worth? 70 bbl.?

6. If 6 tubs of butter cost $42, what will 4 tubs cost? 40 tubs?

7. If 8 yd. of silk cost $32, what will 9 yd. cost?

8. If 9 bbl. of cider cost $45, what will 4 bbl. cost?

9. How much will 60 caps cost at $33\frac{1}{3}¢$ each?

10. At $33\frac{1}{3}¢$ a gallon, what will 150 gallons of molasses cost?

11. A boy bought a bicycle for $15, and sold it at $33\frac{1}{3}\%$ above cost. What did he get for it?

12. If a newsboy buys papers at 2¢ each, and sells them at 3¢, what per cent of profit does he make?

13. If a boy buys papers at 1¢ each, and sells them at 2¢, what per cent of profit does he make?

14. What will my board amount to in 12 weeks, if I pay at the rate of $35 for 7 weeks?

15. If 4 men can do a piece of work in 6 days, how long will it take 8 men to do the same work?

16. How many cubic feet are there in a rectangular block of granite 4 ft. long, 3 ft. wide, and 2 ft. thick?

17. How many square rods in a garden 4 rd. long and 3 rd. wide?

18. If 10 bbl. of beef cost $70, what will 8 bbl. cost?

1. Draw a square 1 foot on a side, and divide it into square inches. How many square inches in one row? How many rows? How many square inches then in the square? How many square inches in a square foot?

2. Draw a square 1 yard on a side, and divide it into square feet. How many square feet in one row? How many rows? How many square feet in the square? How many square feet in a square yard?

3. Using a scale of 2 in. to a yard, draw a square 1 rod on a side. Divide it into square yards. How many rows have you? How many squares in a row? How many square yards have you? How many square yards in a square rod?

4. Copy this table on your paper, filling in the blanks:

square inches (sq. in.)	= 1 square foot	(sq. ft.)
square feet	= 1 square yard	(sq. yd.)
square yards	= 1 square rod	(sq. rd.)
160 square rods	= 1 acre	(A.)

5. How many square inches in 8 sq. ft.?

6. How many square feet in 1728 sq. in.?

7. How many square yards in 81 sq. ft.?

8. How many square feet in 16 sq. rd.?

9. How many square rods in 4 acres?

10. How many square rods in 5 A. 120 sq. rd.? In 6 acres?

11. How many square rods in $\frac{1}{2}$ an acre?

12. Find the area in square rods of a rectangular piece of land 80 rd. long and 2 rd. wide. How many acres are there?

13. How many acres are there in a rectangular plot of land 32 rd. long and 10 rd. wide?

14. Why are there 144 square inches in a square foot? Why are there 9 square feet in a square yard? Why $30\frac{1}{4}$ square yards in a square rod?

15. Change 4 sq. rd. to square yards. Change your square yards to square feet. Change your square feet to square inches.

ORAL.

1. James receives \$8 a week, and his sister $\frac{3}{4}$ as much. How much do both receive in a week?

2. If a circular lake is 42 rd. across, how far is it round it?

3. If George earns \$42 in 7 weeks, how long will it take him to earn \$72?

4. I have an album which has 20 pages, and 4 pictures on a page. How many pictures does it hold?

5. I bought a pound of maple sugar, but have given away 12 oz. How many ounces have I left?

6. Henry measured a room with a yard stick, and found it to be $5\frac{1}{3}$ times the length of the stick. How many feet long is the room?

7. If in shipping 6 doz. eggs, $1\frac{1}{2}$ doz. are broken, how many eggs are not broken?

8. If 6 peaches fill a quart measure, how many of the same size will fill a peck measure?

9. How many pints in $\frac{1}{4}$ of a gallon? In $\frac{1}{2}$ of a gallon?

10. What is $\frac{1}{6}$ of my age if $\frac{1}{3}$ of it is 6 years?

11. If $\frac{1}{9}$ of my money is \$12, what is $\frac{1}{12}$ of it?

12. How many inch cubes can be laid together, side by side, on a square foot of surface? How many layers could you put on top of this to equal 1 foot in height? What form would you have?

13. How many cents in $\frac{1}{2}$ of a dollar? In $\frac{1}{4}$ of a dollar? In $\frac{1}{5}$ of a dollar? In $\frac{3}{4}$ of a dollar?

14. What per cent of anything is $\frac{1}{2}$ of it? $\frac{1}{4}$ of it? $\frac{1}{5}$ of it? $\frac{3}{4}$ of it?

15. What part of a dollar is 50 cents? 25 cents? 20 cents? 75 cents?

16. What part of anything is 50% of it? 25% of it? 20%? 75%?

17. How long will it take to earn \$2 at \$$\frac{1}{3}$ a day?

MISCELLANEOUS TABLES.

12 things = 1 dozen.	20 things = 1 score.
12 dozen = 1 gross.	24 sheets = 1 quire.
12 gross = 1 great gross.	20 quires = 1 ream.

1. How many sheets of paper in $12\frac{1}{2}$ quires? In $12\frac{1}{2}$ reams?

2. What will 7200 sheets of paper cost at \$6 a ream?

3. How many pencils are there in 25 boxes, if each box contains 1 gross?

4. What will 36 gross of lead pencils cost at 3¢ each?

5. How old is a man who is four score and ten years old?

6. A printer used 3 reams, 5 quires, 19 sheets of paper in printing posters. If each sheet made 2 posters, how many posters did he print?

7. What is the cost of 3240 sheets of foolscap at 24 cents a quire?

8. If a dealer sold 25 boxes of ink, and each box contained 2 doz. bottles, how many gross did he sell?

9. How many single things in 5 great gross?

10. How many sheets in $8\frac{3}{4}$ quires? In $\frac{3}{5}$ of a ream?

11. If a person buys a ream of paper for \$3, and retails it at 1¢ a sheet, how much profit will he make?

12. How many reams of paper at 10¢ a quire can be bought for \$6?

13. At $\$1\frac{1}{2}$ per dozen, what will 4 gross of writing books cost?

14. If pencils cost \$2.88 a gross, what will 1 doz. cost? What will $3\frac{1}{2}$ doz. cost?

15. What is the cost of $\frac{1}{2}$ a gross of lead pencils at 50¢ a dozen?

16. What will shoe tacks cost a dozen at the rate of \$2.88 a great gross?

17. What will 5 gross of pens cost at the rate of 2 pens for a cent?

18. How much will 9 eggs cost at 20¢ a dozen?

19. Five dozen collars are sold for \$9.00.

ORAL.

1. I want to use 12 pieces of ribbon, each $\frac{1}{6}$ of a yard in length. How many yards do I need?

2. If you walk $3\frac{1}{2}$ miles in 1 hour, $4\frac{1}{2}$ in another, and $3\frac{1}{2}$ in another, how many miles do you walk in the three hours?

3. John had $\$2\frac{1}{4}$; he earned $\$1\frac{1}{4}$ more, and then spent $\$2\frac{1}{4}$. How much money had he then?

4. James paid $\$1\frac{3}{4}$ for a book, and $\$1\frac{1}{4}$ for a toy. How much did both cost?

5. 72 in. equals how many feet? How many yards?

6. How many yards in 66 feet?

7. James's house is $\frac{1}{4}$ mile from the schoolhouse. How far does he walk in going to and from school?

8. How many times can a cup holding $\frac{2}{3}$ of a pint be filled from a jar holding 4 pints?

9. How many bottles, each holding $\frac{1}{4}$ pint, can be filled from a pitcher holding 4 pints?

10. How many bushels of wheat, at $\$\frac{3}{4}$ a bushel, can be bought for $\$6$?

11. Mr. Day bought a sleigh, and paid $\$45$ down, which was $\frac{3}{5}$ of the whole price.

12. If 8 apples are worth 2 oranges, how many oranges can you get for 32 apples?

13. If $\frac{2}{7}$ of the cost of a cow is $\$12$, what is the whole cost?

14. 32 is $\frac{8}{9}$ of what number? $\frac{4}{5}$ of what?

15. 24 is $\frac{3}{5}$ of what number? $\frac{4}{9}$ of what number?

16. $\frac{2}{3}$ of a flag-staff broke off, and the part standing is 30 ft. What part of the staff is standing? What was the length of the staff?

17. After spending $\frac{2}{5}$ of my money for books, and $\frac{1}{5}$ for clothing, how many fifths have I left? If I have $\$20$ left, how much had I at first?

18. 40 is $\frac{5}{8}$ of what number? $\frac{8}{9}$ of what number?

1. If 35 yd. of cloth cost \$140, how much will 95 yd. of the same cloth cost?

2. How many square inches in the top of a table 2 ft. square?

3. I have 4 bins containing 66 bu., 47 bu., 95 bu., and 36 bu. of corn. If 1 bu. of corn weighs 60 lb., how many pounds of corn have I?

4. Last year to heat the schoolhouse we burned 98 tons of coal. It cost \$6.25 a ton.

5. Divide \$3600 among 3 persons. Give the first $\frac{1}{6}$ of it, the second $\frac{1}{4}$ of it, and the third the rest.

6. How many miles does a swallow fly in 2 hours, if it flies 280 rods a minute?

7. What will 1 pk. of grass seed cost if 14 bu. cost \$43.12?

8. What is the cost of 65 firkins of butter at 28¢ a pound, 56 lb. to a firkin?

9. If 8 pairs of fur gloves cost \$56, how many pairs of the same kind of gloves can you get for \$161?

10. What is the cost of $6\frac{1}{2}$ bu. of potatoes at 25¢ a peck?

11. Find the cost of 5 lb. 8 oz. of tea at 60¢ a pound?

12. My dining room is 18 ft. by 20 ft. A mat covering the center of the room is 16 ft. by 18 ft. How many square feet of the floor is covered? Is uncovered?

13. If the fare to New York is \$5.75, how much money ought the railroad company to receive from a train of 9 cars, each carrying 42 passengers?

14. A dairyman made 377 lb. of butter in May, 417 lb. in June, 386 lb. in July, 295 lb. in August. How many tubs, each holding 25 lb., will hold it?

15. How many years will it take a man to save \$1944, if he saves \$27 a month?

16. If 23 tons of coal cost \$115, how many tons can be bought for \$145?

17. A merchant had 936 yd. of muslin, and sold $\frac{5}{8}$ of it.

ORAL.

1. What is 10% of \$900? \$40? \$200? \$10?

2. A man had \$60, and gave $33\frac{1}{3}$% of it to his daughter.

3. What per cent of 12 is 3? Of 120 is 60? Of 125 is 25?

4. 60 is 20% of what number? 50 is 25% of what number?

5. \$70 is 10% of how many dollars?

6. A man paid \$80 for a horse, and sold it for 10% more than it cost him. For how much did he sell it?

7. A man bought a horse for \$80, and sold it for \$88. How many dollars did he gain? What per cent did he gain?

8. A man paid \$5 for a hat, and sold it at 20% profit. For what did he sell it?

9. A dealer paid \$5 for a hat, and sold it for \$6. What per cent did he gain?

10. A merchant bought velvet at \$4 a yard, and sold it at \$5 a yard. What per cent did he gain?

11. A merchant bought velvet at \$5 a yard, and sold it at \$4. What was the per cent of loss?

12. How many days in 6 weeks? In 10 weeks? In 7 weeks? In 9 weeks?

13. How many weeks in 35 days? In 49 days? In 56 days?

14. How many seconds in 5 minutes? In 10 minutes?

15. How many square feet in a board 20 ft. long and $1\frac{1}{2}$ ft. wide?

16. How many square yards in a pavement 12 yd. long and 5 yd. wide?

17. How many square yards in 36 sq. ft.? In 90 sq. ft.? In 72 sq ft.?

18. How many square feet in 9 sq. yd.? In 5 sq. yd.? In 3 sq. yd.?

19.

$3\frac{1}{3} + \frac{1}{3}$	$3\frac{2}{3} + 5\frac{1}{3}$	$7\frac{1}{2} + \frac{1}{2}$	$4\frac{1}{2} + 6\frac{1}{2}$
$7\frac{1}{2} + 1\frac{2}{3}$	$5\frac{1}{3} + 5\frac{2}{3}$	$9\frac{1}{2} + \frac{1}{2}$	$7\frac{1}{2} + 9\frac{1}{2}$
$2\frac{1}{4} + \frac{1}{2}$	$8\frac{1}{4} + 1\frac{3}{4}$	$7\frac{3}{4} + 9\frac{1}{4}$	$9\frac{3}{4} + 9\frac{1}{4}$

1. A man bought 3 tons of hay at $18.50 a ton, 12 bbl. of apples at $2.50 a bbl., and a suit of clothes for $50. In payment he gave 17 bbl. of flour at $5.75 a bbl., and the balance in money. How much money did he give?

2. If the number of pages in a book is 178, and the average number of words on a page is 307, how many words are there in the book?

3. Nellie is trying to earn money enough picking berries to buy a writing-desk that costs $3.87. If she sells her berries at 9¢ a quart, how many quarts must she pick?

4. How many yards of cloth at 9¢ a yard, can be bought for $486?

5. Add:

9.7	8.9	2.2	6.8	1.6	6.4
1.6	6.1	3.4	3.3	1.0	7.9
3.8	5.0	9.9	6.7	2.3	7.2
6.1	3.7	9.3	8.0	6.1	6.2
0.5	1.1	7.6	6.1	6.8	7.9
1.8	8.2	9.1	0.8	1.5	3.2

6. Subtract:

16.8	8.4	169.5	98.4	6.2	8.0
9.7	6.7	83.7	89.5	1.7	1.6

7. Multiply:

.6 by .17	.9 by .84	1.9 by 8.64	.8 by .04
1.8 by .14	.9 by 1.01	6 by .06	.8 by .08

8. If a man walks 3.75 miles in an hour, how far can he walk in 6.3 hours?

9. What must I pay for 3.6 feet of land at $0.37 a foot?

10. Divide 6.51 by 7.

11. Divide 4.18 by 4.

12. If 3 pk. of berries cost $2.88, what will a quart cost?

ORAL.

1. How many faces has a cube?

2. How many edges has a cube?

3. How many corners has a cube?

4. How many faces has the crayon-box?

5. How many edges has the crayon-box?

6. How many corners has the crayon-box?

7. If the crayon-box has the same number of faces, edges, and corners as the cube, is it a cube? Why not?

8. Can you build a cube with 8 small cubes? What are the dimensions of it?

9. If you make your cube 1 block longer, wider, and higher, how many blocks do you use?

10. If a block is 4 in. long, 4 in. wide, and 2 in. high, is it a cube? How many times higher must it be to be a cube? What part of a cube is it? How many square inches in the top of the block? How many in one side? How many in one end?

11. If 4 qt. of currants cost \$1, how much is that a peck? A bushel?

12. If an oblong is 16 inches round it, how long and wide might it be?

13. If a square is 16 in. round it, how long and wide is it?

14. Find the area of a board 6 ft. long and $1\frac{1}{2}$ ft. wide.

15. A rectangular garden-bed is 8 ft. long and 4 ft. wide. What is the perimeter? What number of square feet does it contain?

16. What is the area in square yards of a rectangular flower-bed 27 ft. long and 6 ft. wide?

17. What do you call a cubical block, if each edge measures 1 inch?

18. What do you call a cubical block, if each edge measures 1 foot?

1. At $45 a head, how many cows can I buy for $1035?

2. Mrs. Jones bought $18\frac{2}{3}$ yd. of picture wire. After hanging her pictures she had 7 ft. left.

3. What must I pay for 18 pk. 3 qt. of onions at 48¢ a peck?

4. How many pounds of coal in $\frac{3}{4}$ of a ton?

5. To help a poor family, two little girls made 10 pounds of candy, and sold it for 3¢ an ounce. How much money can they give to the family?

6. If $\frac{3}{4}$ of a pound of tea cost 72 cents, how much is the tea a pound?

7. How many inches in a wire 72 yd. long?

8. How many gallons of molasses worth 10¢ a quart can you buy for $1.20?

9. If 8 lb. of sugar cost 48 cents, what must you pay for 2718 lb.?

10. If $\frac{1}{2}$ lb. of butter cost 15 cents, how much should a grocer pay for 10 tubs, each weighing 60 lb.?

11. If an ounce of coffee is used for breakfast every day, how long will 15 lb. last?

12. A man earns $1350 a year. If his expenses every year are $875, how much money can he save in 5 years?

13. A man who had 256 gal. of vinegar, put it into barrels, each holding 32 gal.

14. Martha picked 15 qt. of berries, and sold them for 5¢ a pint. How much did she get for her berries?

15. A farmer, having 600 sheep, sold 215 of them to a butcher, and 310 to another farmer.

16. Mrs. Brown sold 60 eggs at 20¢ a dozen, and received 90 cents for them. How much more money should she receive?

17. Sold a horse for $175, and lost $35. What did it cost? How much would have been gained or lost by selling the horse for $190?

18. A dealer sold 20 doz. pairs of shoes at $1.75 a pair.

ORAL.

1. In selling a watch a man lost \$20. If this was 20% of the cost, what did he pay for it?

2. A man sold a watch so as to gain \$25, and this was 25% of the cost.

3. A farmer lost 200 sheep, which was 10% of his entire flock. How many sheep had he in his flock?

4. If you earn \$6 in 3 days, how long will it take you to earn \$1? \$2? \$4? \$10? \$18? \$20?

5. Find the area of a rectangular lot that is 12 rd. long and 9 rd. wide?

6. How many pint bottles can be filled with a gallon of wine?

7. What do you mean when you say anything is 5 feet square? Do you mean the same thing when you say anything contains 5 sq. ft.?

8. Find the square feet in a board 8 ft. long and 9 in. wide.

9. How many gills in 4 quarts? 6 quarts?

10. How many square feet are there in 9 sq. yd.? In 18? In 27? In 36?

11. Find the sum of 5 square feet and 2 feet square?

12. Find the cost of 10 lb. of crackers at $9\frac{1}{2}$ cents a pound.

13. Find the cost of $9\frac{1}{2}$ pounds of butter at 20 cents a pound.

14. Find the cost of 12 cords of wood at \$$6\frac{1}{2}$ a cord.

15. Find the cost of 9 lb. of raisins at $10\frac{1}{3}$ cents a pound.

16. Find the cost of $10\frac{1}{3}$ pounds of sugar at 6 cents a pound.

17. At one-half a dime each, how many oranges can you buy for 5 dimes? 10 dimes?

18. If you had \$$\frac{1}{2}$, and spent \$$\frac{1}{3}$, what part of a dollar did you have left?

19.

90 — 50	50 — 20	80 — 30	80 — 60
40 — 20	70 — 20	60 — 30	90 — 30
80 — 40	70 — 30	90 — 40	90 — 60
50 — 30	60 — 40	60 — 20	70 — 50

1. Divide 5208 by 21.

2. Divide 4991 by 31.

3. Multiply 8653 by 467.

4. Add 7846, 8463, 4635, 3879, 6387, 4365, 3657, 6578, 5474, 8547, 8639, 5786, 7896.

5. A man sold land for $45 an acre, receiving $7200 for it. How many acres did he sell? How much would he have received if he had sold it at $52 an acre?

6. Goods that cost $592 were sold at a loss of $116.18.

7. How many square yards are there in a rectangular field 48 yd. long and 75 ft. wide? 75 ft. are how many yards?

8. Find the number of square inches in the surface of a box 24 in. long, 18 in. wide, and 12 in. high.

9. Find the number of cubic inches in this box.

In the next four examples, and all others like them, first perform the operations indicated within the parentheses, remembering that within a parenthesis, as without, the signs of multiplication and division are to be used first.

10. $84 - (81 \div 9) \times 7 = ?$

11. $120 \div 6 + 30 - 6 \times 4 = ?$

12. $(3 \times 5 \times 6 - 180 \div 3) \div 9 = ?$

13. $(9 \times 12 - 7 \times 8) + 105 \div 5 = ?$

14. Change 4 rd. 12 ft. to inches.

15. How many cubic feet of water will a rectangular cistern hold that is 36 ft. long, 18 ft. wide, and 9 ft. deep?

16. A farmer sold his wheat for $687, and his potatoes for 3 times as much. How much did he receive for both?

17. I paid $110.40 for butter at 23¢ a pound.

18. How many cubic feet of air are there in a room 14 ft. square, and 9 ft. high?

19. What is the cost of 4 loads of flour, 12 bbl. to the load, at $4\frac{1}{2}$ per barrel?

20. From $84\frac{1}{3}$ take $52\frac{1}{3}$. From $24\frac{4}{5}$ take $9\frac{1}{5}$.

ORAL.

1. If a man makes a 3 days' journey, travelling 12 hr. each day, how many hours does he travel?

2. A boy gave away $2\frac{1}{2}$ apples, which was $\frac{1}{4}$ of all he had. How many had he?

3. A boy gave away $2\frac{1}{2}$ apples, which was 25% of all he had. How many had he?

4. If 6 men can do a piece of work in 9 days, in how many days can 2 men do it?

5. If 4 men can do a piece of work in 8 days, how many men will it take to do the same work in 4 days?

6. If 4 men can do a piece of work in 6 days, in how many days will they do a piece of work 4 times as large?

7. If the wages for 10 weeks is \$50, how much is that a month?

8. If 7 horses eat 10 bu. of oats in a week, how many bushels will 14 horses eat in the same time?

9. If 5 tons of hay will keep 3 horses through the winter, how many tons will keep 30 horses the same time?

10. A man bought 20 pears at the rate of 2 for 3 cents. What did they cost?

11. A man bought 30 pears at the rate of 3 for 2 cents. What did they cost?

12. How many pears at 4¢ each must you give for 4 oranges at 5¢ each?

13. If 4 apples cost 6 cents, what will 8 cost? 12 cost?

14. If 3 apples are worth 6 cents, how many apples are worth as much as 8 pears at 3¢ each?

15. In 96 in. how many yards?

16. In 35 quarters of a yard how many yards?

17. In 7 yards and 3 quarters, how many quarters?

18. What must you give for 4 bbl. of vinegar at \$6¼ a barrel?

19. Add 1 ft. 6 in. and 1 ft. 6 in.

1. What remains of $26\frac{4}{5}$ bu. after taking out $12\frac{9}{10}$ bu.?

2. How many feet in 1 mile or 320 rods?

3. Multiply 212 by $26\frac{1}{2}$.

4. Multiply 728 by $35\frac{1}{4}$.

5. How far is it round a rectangular park 174 ft. long and 96 ft. wide? How many steps do you take in walking round it if each step is $1\frac{1}{2}$ feet long?

6. A wire fence costs $4\frac{1}{2}$ cents a foot. What must I pay for enough to fence a square field 200 ft. long?

7. How many cubic inches in a rectangular box 10 in. long, 8 in. wide, and 4 in. deep?

8. If I have a pile of inch cubes 8 in. long and 4 in. wide, how high must I make the pile to use 96 cubes?

9. Mr. Jones paid \$1750 for a lot of land. He built a house that cost \$3215.50 more than the lot, and a barn that cost \$374.58 less than the lot. Find the cost of all?

10. At \$3.00 each, what is the largest number of hats that can be bought for \$50, and how much money will be left?

11. At \$0.32 for a can of soup, how many cans will \$23.36 buy?

12. If 70 horses are sold for \$15,400, what is the average price of one?

13. A steamer runs 576 miles in 24 hours. How far will she run in 245 hours?

14.	15.	16.	17.
\$234.69	\$394.49	\$345.16	\$400.00
576.83	873.62	864.73	789.86
58.98	508.77	25.49	458.45
4.67	564.53	7.85	634.25
.32	88.99	18.64	498.98
.07	5.64	240.59	96.57
5.10	38.40	34.67	237.80
32.78	527.80	678.45	649.86
47.76	60.74	16.88	543.16

ORAL.

1. What will $\frac{5}{8}$ of a pound of mace cost at 10¢ an ounce?

2. Find the cost of $1\frac{1}{2}$ gal. of oil at $.16 a gallon.

3. Find the cost of $1\frac{1}{2}$ lb. of butter at $0.20 a pound.

4. Find the cost of 6 yd. of cotton at 10¢ a yard.

5. Find the cost of 4 doz. buttons at 12¢ a dozen.

6. What is a rectangle?

7. Are all squares rectangles?

8. Are all rectangles squares?

9. A rectangular solid is a solid bounded by six rectangles. Name 5 objects that are rectangular solids.

10. How many hours from 6 A.M. to 4 P.M.?

11. How many hours from 1 A.M. to 4 P.M.?

12. What is $\frac{1}{60}$ of an hour called?

13. Compare a 3-inch square and 3 square inches.

14. If a square contains 36 sq. in., how many inches is it on a side?

15. If you can put 20 large apples in a peck, how many of the same size will a bushel basket hold?

16. Read the following sums of money as cents: $5, $4.25, $2.28, $1.05.

17. Read the following as dollars, or as dollars and cents: 463 cents, 202 cents, 560 cents, 1004 cents, 500 cents.

18. Multiply $84.00 by 10; $6.50 by 100; $0.05 by 100; $11.25 by 100.

19. Divide $9624 by 100; $8.70 by 10; $26.15 by 100; $40.05 by 10.

20. Multiply $\frac{2}{3}$ of 9 by $\frac{3}{4}$ of 12.

21. Find the cost of 2 yd. of cloth at 12¢ a yard, and $\frac{1}{2}$ yd. of ribbon at 10¢ a yard.

22. Find the cost of 5 lb. of sugar at 7¢ a pound, and $2\frac{1}{2}$ gal. of oil at 10¢ a gallon.

23. What is my weekly milk bill, if I take 4 qt. daily at 5¢ a qt.?

Divide 11375 by 325.

$$\begin{array}{r} 35 \\ 325\,)\,11375 \\ 975 \\ \hline 1625 \\ 1625 \\ \hline \end{array}$$

The explanation for dividing by three figures is so similar to that for division by two figures that it is not necessary to repeat it here.

Divide:

1.	2480 by 124;	4494 by 321.
2.	10950 by 365;	7875 by 225.
3.	12560 by 314;	22824 by 317.
4.	47412 by 108;	10725 by 325.
5.	64440 by 120;	3168 by 132.
6.	54576 by 144;	3780 by 315.
7.	5616 by 234;	1107 by 123.
8.	8316 by 231;	7614 by 282.
9.	68952 by 221;	3813 by 123.
10.	63336 by 203;	678273 by 321.
11.	549661 by 327;	24416 by 436.
12.	18144 by 144;	18144 by 288.
13.	428796 by 254;	936785 by 349.
14.	658879 by 247;	948673 by 978.
15.	689284 by 458;	847635 by 285.
16.	843660 by 327;	955980 by 452.
17.	676269 by 759;	985500 by 675.
18.	828852 by 578;	317646 by 126.
19.	238788 by 134;	456104 by 146.
20.	603264 by 192;	811332 by 372.
21.	11286 by 418;	13872 by 408.
22.	17500 by 625;	24588 by 683.
23.	25536 by 672;	31629 by 811.
24.	29725 by 725;	28896 by 672.
25.	54576 by 379;	12560 by 314.
26.	64440 by 537;	10950 by 365.
27.	47412 by 439;	518077 by 763.
28.	22824 by 317;	339720 by 456.

ORAL.

1. At 12¢ a gallon, what will $2\frac{2}{3}$ gal. of oil cost?

2. Jennie picked 3 qt. of berries, and John picked $1\frac{1}{4}$ pecks. How many quarts did both pick?

3. At $\$1\frac{1}{4}$ a yard, what will 4 yd. of cloth cost?

4. What will 1 quire of paper cost at $\frac{1}{2}$¢ a sheet?

5. At the rate of 3 apples for 2 cents, how much will 12 apples cost?

6. A man began work at 9.30 A.M., and worked until 1 P.M. What did he earn at the rate of 20¢ an hour?

7. How many pins placed vertically 1 in. apart will it take to extend a foot?

8. How many posts 1 rd. apart will it take to extend a mile?

9. At $\frac{1}{2}$¢ an ounce, what will be the postage on a package weighing $\frac{1}{4}$ of a pound?

10. At the rate of 3 apples for 2¢, how many apples can I buy for 10 cents?

11. How many cows at $50 each can be bought for $500?

12. What will 18 eggs cost at 20¢ a dozen?

13. If 6 bu. of oats are worth as much as 4 bu. of corn, how many bushels of oats are worth as much as 18 bu. of corn?

14. At the rate of 18 miles in 6 hours, how many miles can a man walk in 9 hours? How long will it take him to walk 9 miles?

15. How many square feet in a floor 12 ft. long and $8\frac{1}{2}$ ft. wide?

16. 6 eggs cost 10 cents. What is true about a dozen eggs? About 5 cents? About 20 cents? About 2 doz. eggs?

17. How many square feet in the floor of a room 16 ft. by $10\frac{1}{2}$ ft.?

18. If oil costs 8¢ a gallon, how much can be bought for 1 cent?

19. A woman has 15 yards of muslin. How much will she have after she uses $14\frac{3}{4}$ yards?

1. $932 - (268 - 8 \times 8) + (240 \div 6) \times 7 - 27 \times 8$.

2. Find the number of cubic inches in a rectangular block 2 ft. long, 1 ft. wide, and 9 in. thick.

3. Add 46, 728, 437, 873, 6398, 4765, 758, 945.

4. Multiply 564 by 897.

5. From \$735 subtract \$287.32.

6. A man spends \$285 of his salary for board, \$175 for clothes, \$140 for other expenses, and has \$650 left.

7. Reduce 742 dry quarts to higher denominations.

8. If 34 yd. of silk cost \$59.50, how many yards can be bought for \$154?

9. A man lost \$754 on a farm which he sold for \$6225. How much would he have received for it if in selling he had gained \$575?

10. Divide 16820 by 29.

11. What sum of money added to \$675 will make \$1234.64?

12. A man paid \$236 for a carriage, and 4 times as much for a span of horses. Find the cost of both.

13. Harry has 126 marbles, which is 49 less than his brother has. How many have both?

14. At 5¢ a square foot, how much will 68 boards cost, if each board is 16 ft. long and 1 ft. wide?

15. A bought 266 sheep at \$5 a head. He sold $\frac{5}{7}$ of them at \$6, and the remainder at \$4 a head.

16. At \$16 a ton, how many tons of hay cost \$720?

17. Divide 5100463 by 569.

18. Multiply 7684 by 460.

19. Divide 10248 by 61.

20. How many sheets of paper are there in 248 quires?

21. Find the cost of one, when I pay \$2.94 for 14 lb. of coffee, \$33 for 15 hats, \$325 for 13 sofas, \$331.50 for 300 yd. of carpet.

22. A farmer had 800 bu. of wheat, and sold 8 loads of 70 bu. each. How many bushels had he left?

ORAL.

1. $\frac{1}{2} + \frac{1}{2}$ $1 - \frac{1}{2}$ $10\frac{1}{2} + 3\frac{1}{2}$ $16\frac{1}{2} - 9\frac{1}{2}$
$1 + \frac{1}{2}$ $1\frac{1}{2} - \frac{1}{2}$ $6\frac{1}{2} + 3$ $17\frac{1}{2} - 8$
$1\frac{1}{2} + \frac{1}{2}$ $2 - \frac{1}{2}$ $8\frac{1}{2} + 9$ $24 - 16\frac{1}{2}$
$2\frac{1}{2} + \frac{1}{2}$ $2\frac{1}{2} - 1\frac{1}{2}$ $7\frac{1}{2} + 7\frac{1}{2}$ $34\frac{1}{2} - 24\frac{1}{2}$
$6\frac{1}{2} + \frac{1}{2}$ $4 - 1\frac{1}{2}$ $21 + 9\frac{1}{2}$ $24\frac{1}{2} - 12\frac{1}{2}$
$1\frac{1}{2} + 2\frac{1}{2}$ $7\frac{1}{2} - 2\frac{1}{2}$ $13\frac{1}{2} + 7\frac{1}{2}$ $9\frac{1}{2} - 3$
$6\frac{1}{2} + 2\frac{1}{2}$ $6 - 2\frac{1}{2}$ $19\frac{1}{2} + 9\frac{1}{2}$ $15 - 7\frac{1}{2}$

2. Perform the following operations, and then add $2\frac{1}{2}$ to each:
$3\frac{1}{2} + 6$ $7 + 2\frac{1}{2}$ $15 - 7\frac{1}{2}$ $13\frac{1}{2} - 8$
$12\frac{1}{2} - 6\frac{1}{2}$ $4 \times 6\frac{1}{2}$ $6 \times 7\frac{1}{2}$ $8\frac{1}{2} + 12\frac{1}{2}$

3. At $3\frac{1}{2}$¢ a pint, how much will 2 gallons of milk cost?

4. Make and perform problems from the following:
$7\frac{1}{2} \times 8$ $7 + 2\frac{1}{2}$ $6 \times 8\frac{1}{2}$ $12\frac{1}{2} + 6\frac{1}{2}$
$15 - 4\frac{1}{2}$ $9\frac{1}{2} \times 9$ $5 \times 7\frac{1}{2}$ $19 - 12\frac{1}{2}$ $7 - 3\frac{1}{2}$

5. How many halves in the following numbers?
2? $3\frac{1}{2}$? 7? $5\frac{1}{2}$? $8\frac{1}{2}$? 11? $12\frac{1}{2}$? $9\frac{1}{2}$? 6?

6. Each of the following numbers is $\frac{1}{2}$ of what number?
2? 4? $2\frac{1}{2}$? $\frac{1}{2}$? $2\frac{1}{4}$? $\frac{1}{4}$? 5? $4\frac{3}{4}$? $\frac{1}{3}$? $1\frac{3}{4}$?

7. $\frac{2}{4} \times 2$ $1\frac{1}{2} \times 2$ $2 \times \frac{1}{2}$ $\frac{6}{8} \times 2$
$1\frac{1}{4} \times 4$ $1\frac{1}{2} \times 4$ $\frac{3}{4} \times 2$ $6 \times \frac{1}{4}$
$2\frac{3}{4} \times 4$ $\frac{1}{2} \times 4$ $2\frac{2}{4} \times 2$ $3\frac{1}{2} \times 4$
$\frac{3}{4} \times 2$ $4 \times 2\frac{1}{2}$ $2 \div 4$ $4 \times \frac{1}{4}$
$4\frac{1}{4} \times 8$ $8 \times 2\frac{3}{4}$ $6\frac{3}{4} \times 4$ $3 \times \frac{1}{4}$

8. How many eighths in $\frac{1}{2}$, $\frac{3}{4}$, $1\frac{1}{2}$, $2\frac{3}{8}$, $4\frac{1}{4}$, $2\frac{1}{2}$, $4\frac{1}{2}$, $6\frac{1}{4}$?

9. If $\frac{1}{2}$ a yard of cloth costs 20 cents, what will be true of 10 cents? 40? 1 yd.? $2\frac{1}{2}$ yd.? $3\frac{1}{4}$ yd.?

10. When $\frac{3}{4}$ of a pound of tea costs 20 cents, what will be true of $\frac{1}{4}$ lb.? $\frac{1}{2}$ lb.? 1 lb.? $1\frac{1}{2}$ lb.? 10 cents? 20 cents? 40 cents?

11. If $\frac{3}{4}$ of a barrel of sugar costs \$6, what will $\frac{3}{8}$ cost? $\frac{5}{8}$?

12. What part of a peck is a quart? 2 qt.? 3 qt.? 4 qt.? 5 qt.? 6 qt.?

1. Find the area of these right-angled triangles, first changing the dimensions so that they shall be alike:

Base 10 yd., altitude 27 ft.
Base 15 in., altitude 4 ft.
Base 36 in., altitude 2 yd.
Base 2 ft. 6 in., altitude 4 ft.
Base 3 yd. 1 ft., altitude 5 ft.
Base 96 yd., altitude 15 ft.
Base 1 rd., altitude 8 ft.

Make diagrams for each of the following examples:

2. A rectangular lot is 50 ft. by 75 ft. The house on the lot is 25 ft. by 50 ft. How many square feet are there in the yard?

3. How many square yards are there in the floor of a room 24 ft. by 18 ft.?

4. How many square feet are there in the floor of the same room?

5. If this same room is 12 ft. high, how many square feet are there in the four walls?

6. If a building lot is 100 ft. square, and a house is built on it that is 30 ft. by 60 ft., with an L part 15 ft. square, how many square feet are covered by the building, and how many square feet remain for the yard?

7. Measure a crayon box, omitting fractions of an inch, and find the square inches in its outer surface.

8. Measure your schoolroom, omitting fractions of a foot, and find the number of square feet in its entire surface.

9. Measure your schoolyard, omitting fractions of a yard, and find the number of square yards in it.

10. From the area of the schoolyard subtract the area of the land covered by the schoolhouse.

11. If 5 bbl. of flour weigh 980 lb., what does 1 bbl. weigh? What is it worth at 3¢ a pound?

ORAL.

1. A boy is carrying $6\frac{1}{4}$ lb. of flour and $6\frac{1}{8}$ lb. of ham. What is the weight of his load?

2. How much will 60 eggs cost at 20 cents a dozen?

3. If you should buy a paper of pins for 8 cents, some tape for 6 cents, and an apron for 30 cents, how much change would you receive from 50 cents?

4. At 25¢ each, you could buy how many things for \$1? For \$2?

5. Give a short method for finding how many articles can be bought for a certain number of dollars at 25¢ each.

At 25¢ each, you can buy how many:

6. Base balls for \$9?

7. Hats for \$11?

8. Cakes of soap for $\$3\frac{1}{4}$?

9. Pounds of candy for $\$2\frac{1}{2}$?

10. Yards of cloth for $\$5\frac{3}{4}$?

11. At $33\frac{1}{3}$¢ each, how many things can you buy for \$1? \$2?

12. State a short way for finding how many things at $33\frac{1}{3}$¢ each can be bought for a given number of dollars.

At $33\frac{1}{3}$¢ each, you can buy how many:

13. Yards of ribbon for \$4?

14. Pairs of cuffs for \$12?

15. Pounds of butter for \$9?

16. Pounds of candy for $\$1\frac{1}{3}$?

17. Pecks of nuts for $\$2\frac{2}{3}$?

18. Dozen of oranges for $\$3.33\frac{1}{3}$?

19. Dolls for $\$4.66\frac{2}{3}$?

20. Knives for $\$6\frac{1}{3}$?

21. Straw hats for $\$2.66\frac{2}{3}$?

22. Cans of milk for \$5?

23. Articles for $\$7\frac{1}{3}$?

24. Articles for \$8?

1. What is 25% of 960 miles?

2. What is $33\frac{1}{3}\%$ of 2757 men?

3. 18 is 25% of what number?

4. The area of a rectangle is 270 yd., and the width is 15 yd. What is the length?

5. Find the area of a triangle, whose base is 26 ft. and altitude 14 ft.

6. What is the area of a triangle whose altitude is 10 yd. and base 40 ft.?

7. Find the circumference of a circle whose diameter is 21 inches.

8. Find the circumference of a circle whose diameter is 35 inches.

9. Find the surface of a prism whose altitude is 7 ft. and its base a square, each side of which is 4 feet.

10. Find the entire surface of a square pyramid whose slant height is 16 ft. and each side of the base six ft.

11. How many yards are there in 1143 feet?

12. How many quarts are there in 15 bu. 3 pk. 6 qt.? How many quarts would each boy receive if the nuts were equally divided among 15 boys?

13. How many ounces are there in 570 pounds?

14. In a barrel of flour there are 196 lb. What will 5 bbl. cost at 3¢ a pound?

15. What will $\frac{1}{2}$ of 24 cords cost at $\$8\frac{1}{2}$ a cord?

16. If \$1800 is one-half of a man's property, what is one-quarter of it?

17. A miller has 45 sacks of wheat, holding $1\frac{1}{4}$ bu. each. How many bushels of wheat has he?

18. If a man earns \$325 in a year, how much will he have left after paying his board at the rate of \$16 a month?

19. If 3 yd. of silk cost \$1.80, what will be the cost of $5\frac{3}{4}$ yd.?

ORAL.

1. How many ounces in $\frac{1}{2}$ lb.? In $\frac{1}{4}$ lb.? In $\frac{3}{4}$ lb.?

2. How many pounds in $\frac{1}{2}$ ton? In $\frac{1}{4}$ ton?

3. What is the cost of 1 lb. 4 oz. of grass seed at 2¢ an oz.?

4. 1 bu. of oats weighs 32 lb. How many pounds in a peck? Quart?

5. How many feet in 5 yd. 2 ft.?

6. What is the cost of 9 ft. of ribbon at 10¢ a yard?

7. At 10¢ a mile, what will it cost to travel $6\frac{1}{2}$ miles and back again?

8. There are 72 cows and sheep in a field. One sixth are cows. How many sheep are there? How many more sheep than cows?

9. A tree is 72 feet high, and 9 times as tall as it is round it at the base. How many feet round the base?

10. A wagon cost \$60, which is 5 times the cost of both wagon and harness. What is the cost of both wagon and harness?

11. If 6 lb. of coffee cost \$1.80, what will $\frac{1}{2}$ lb. cost?

12. How many men can build a wall in 10 days, if 5 men can build it in 20 days?

13. If 5 men can build a wall in 20 days, in how many days can 10 men build it?

14. How much will $\frac{3}{4}$ of 12 yd. of silk cost, if 7 yd. cost \$14?

15. How much will 9 bbl. of vinegar cost, if 5 bbl. cost \$45?

16. 9 men can mow 36 acres in a day. How many acres can 3 men mow in a day? 6 men? 12 men?

17. If 5 yd. of silk cost \$15, what will 7 yd. cost? 12 yd.?

18. Find the cost of 10 lb. rice @ 7¢.

19. Find the cost of 12 bbl. flour @ \$6$\frac{1}{2}$.

20. Find the cost of 12 months rent @ \$30.

21. If the school is $\frac{3}{4}$ of a mile from Jennie's house, how many miles must she walk every day if she goes home at noon and back in the afternoon?

1. Add:

2.85	8.97	147.02	47.38
15.05	117.36	16.69	208.36
14.72	6.24	307.70	93.46
104.25	105.04	250.38	350.75
27.78	81.49	47.32	68.80
.47	9.96	1.96	78.07
60.48	5.84	.36	273.60
4.96	83.50	21.00	96.69

Find the cost of:

2. 78 bu. of flour at $6.25 a barrel.

3. 86 bu. of wheat at $.94 a bushel.

4. 97 tons of hay at $6.45 a ton.

5. How many barrels of oil at $5 a barrel will pay for 200 lb. of sugar at $4\frac{1}{2}¢$ a pound?

6. How many square feet in a rectangular piece of land 136 ft. long and 125 ft. wide?

7. Find the area and the distance round a rectangular lot 16 yd. wide and 5 rd. long?

8. Find the area of a triangle whose base is 180 feet and altitude 120 ft.

9. Find the convex surface of a tower in the form of a square pyramid whose base is 100 ft. square and slant height 140 ft.

10. I start on a journey with $125.50. If I spend the following sums, $4.22, $8.63, $21.16, $17.34, $14.15, $37.25, what ought I to have on my return?

11. A merchant bought 864 bu. of wheat for $622.08, and sold it at $0.95 a bushel.

12. How many bushels of potatoes, at 65¢ a bushel, will pay for 48 yd. of cloth at $1.30 a yard?

13. A carload of 620 bu. of oats was bought for $175, and sold for 35¢ a bushel.

ORAL.

1. $\frac{1}{2}$ of \$1 = —— cents. $\frac{1}{4}$ of \$1 = —— cents.
$\frac{1}{3}$ of \$1 = —— cents. $\frac{2}{4}$ of \$1 = —— cents.
$\frac{2}{3}$ of \$1 = —— cents. $\frac{3}{4}$ of \$1 = —— cents.
$\frac{1}{5}$ of \$1 = —— cents. $\frac{2}{5}$ of \$1 = —— cents.
$\frac{3}{5}$ of \$1 = —— cents. $\frac{4}{5}$ of \$1 = —— cents.
$\frac{1}{10}$ of \$1 = —— cents. $\frac{2}{10}$ of \$1 = —— cents.
$\frac{3}{10}$ of \$1 = —— cents. $\frac{4}{10}$ of \$1 = —— cents.

2. 50 cents = —— of \$1. 25 cents = —— of \$1.
10 cents = —— of \$1. 20 cents = —— of \$1.
30 cents = —— of \$1. 40 cents = —— of \$1.
60 cents = —— of \$1. 75 cents = —— of \$1.
$66\frac{2}{3}$ cents = —— of \$1. $33\frac{1}{3}$ cents = —— of \$1.

3. There are: —— hours between 10 A.M. and 1 P.M.
—— hours between 8.30 A.M and 2.30 P.M.
—— hours between 9 A.M and 2 P.M.
—— hours between 9.15 A.M and 12.30 P.M.
—— minutes between 10 A.M and 11.30 P.M.
—— months between 1885 and 1895.
—— months between 1887 and 1893.

4. There are: 60 min. in —— hr. 60 sec. in —— min.
120 min. in —— hr. 120 sec. in —— min.
15 min. in —— hr. 15 sec. in —— min.
30 min. in —— hr. 30 sec. in —— min.
45 min. in —— hr. 45 sec. in —— min.
360 min. in —— hr. 360 sec. in —— min.
—— min. in 1 hr. —— sec. in 1 min.
—— min. in 3 hr. —— sec. in 3 min.
—— min. in $\frac{1}{4}$ hr. —— sec. in $\frac{1}{4}$ min.
—— min. in $\frac{1}{6}$ hr. —— sec. in $\frac{1}{6}$ min.

5. At 25¢ each you can buy:
—— —— for 50 cents. —— —— for \$5.
—— —— for 75 cents. —— —— for \$4.

1. A grocer sold $118\frac{3}{4}$ lb. of flour to one customer, $106\frac{7}{8}$ lb. to another, and $230\frac{1}{2}$ lb. to another.

2. Bought a barrel of kerosene oil containing 42 gal. for \$6.30. I sold it for $16\frac{1}{2}¢$ a gallon.

3. If 4 tons of coal cost \$25.50, what will 42 tons cost?

4. Find the cost of 368 bbl. of flour @ $\$4\frac{3}{8}$.

5. Find the cost of 208 yd. of cloth @ $\$\frac{3}{8}$.

6. Find the cost of $508\frac{1}{2}$ bu. potatoes @ $62¢$.

7. Find the cost of $62\frac{1}{4}$ doz. eggs @ $16¢$.

8. Find the cost of $12\frac{3}{8}$ acres land @ \$160.

9. I bought at one time $7\frac{7}{8}$ lb. of meat, and at another time $5\frac{3}{4}$ lb. What did it all cost at $10¢$ a pound?

10. A man had $\$16\frac{1}{4}$. He spent $\$4\frac{3}{8}$ at one time, and $\$6\frac{1}{2}$ at another time. How much money had he left?

11. If $\frac{1}{12}$ of a lot of goods is worth \$360, what is $\frac{1}{3}$ of the lot worth? $\frac{1}{4}$?

12. Add:

$5\frac{7}{8}$	$3\frac{1}{4}$	$7\frac{5}{9}$	$46\frac{1}{2}$	$16\frac{7}{12}$
$2\frac{3}{4}$	$7\frac{2}{3}$	$9\frac{1}{3}$	$24\frac{4}{5}$	$18\frac{3}{4}$
$4\frac{1}{2}$	$8\frac{5}{6}$	$11\frac{1}{9}$	$13\frac{3}{10}$	$65\frac{1}{2}$
$5\frac{5}{8}$	$10\frac{5}{12}$	$16\frac{2}{3}$	$46\frac{2}{5}$	$38\frac{2}{3}$
$6\frac{1}{4}$	$4\frac{1}{4}$	$4\frac{7}{9}$	$14\frac{1}{2}$	$14\frac{1}{4}$

13. What is the cost of 3 pk. 5 qt. of apples at $20¢$ a peck?

14. 50 bbl. of sugar cost \$175, what do 25 bbl. cost?

15. If a hat cost \$2.50, what will 50 hats cost at the same price?

16. A roll of ribbon is 50 ft. long. What is it worth at $9¢$ a yd.?

17. A rectangular piece of land 20 ft. long and $8\frac{1}{2}$ ft. wide contains how many square feet? How many feet of fence will it take to fence it?

18. If there are 240 sq. in. in the top of your desk, and it is 12 in. wide, how long is it?

ORAL.

1. $(56 \div 14) \times 12 - 12$
2. $\frac{3}{4} - \frac{1}{8}$.
3. $\frac{3}{8} + \frac{3}{4}$.
4. $1\frac{1}{8} + 2\frac{1}{4}$.
5. $\frac{4}{6} + 1\frac{0}{8}$.
6. $\frac{5}{6} - \frac{3}{4}$.
7. How many eggs in 3 doz. 6 eggs?
8. How many pints in 1 gal. 1 qt.?
9. From a chest of tea containing 48 lb., there were sold 29 lb. 8 oz.
10. How many feet and inches in $\frac{5}{8}$ of a yard?
11. How many ounces are there in 75 one hundredths of a pound? In 75% of a pound?
12. What will be the cost of 48 lb. of coffee at 25¢ a pound?
13. I paid \$12.75 for eggs at 25¢ per dozen. How many dozen did I buy?
14. How much will 99 yd. of dress goods cost at $33\frac{1}{3}$¢ a yard?
15. How many yards of cloth costing $33\frac{1}{3}$¢ a yard can be bought for \$6?
16. What will be the cost of 24 yd. of carpeting at \$1.25 a yard?
17. If eggs are sold at the rate of 18 for 25 cents, what will 3 doz. cost?
18. If $\frac{2}{3}$ of a yard of cloth cost 6 cents, how many yards can be bought for 72 cents?
19. If $1\frac{1}{2}$ pk. of nuts cost 48 cents, what will 1 quart cost?
20. What is the cost of 6 yd. of tape at 8¢ a yard, and 3 yd. of silk at \$8 a yard?
21. \$6 is $\frac{2}{3}$ of how many dollars?
22. $50 - 12 - 9 - 19$.
23. $72 - 7 \times 9 = ?$
24. $(\frac{3}{4}$ of $80) + 15 = ?$
25. $2\frac{1}{2} =$ —— fourths.
26. Add $1\frac{3}{4}$ and $\frac{1}{2}$.
27. $2\frac{1}{2} + \frac{1}{8} - \frac{1}{4} = ?$
28. If 4 yd. of muslin cost 48¢, how much will $\frac{1}{3}$ of a yard cost?
29. If you multiply 22 by 12, and divide the product by 3, what short method can you use?

1. A man had \$6,300. He paid $\frac{2}{3}$ of it for a house, \$475.50 for repairs, and \$264.75 for furniture. How much money had he left?

2. A man sold 56 yards of cloth for \$128, gaining \$16. What did it cost him a yard?

3. A farmer sold $\frac{1}{8}$ of his farm of 224 acres at \$52.25 an acre?

4. A man had 10.5 yd. of cloth, and used 4.15 yd. to make a suit.

5. If 23 carriages cost \$4025, what are 80 carriages worth?

6. A farmer's wife sold a storekeeper 18 doz. eggs at 14¢ a dozen, and 35 lb. of butter at 21¢ a pound. She took her pay in cloth at 15¢ a yard. How many yards did she get?

7. A horse costs \$265, a carriage \$235, and a hack 3 times as much as both. What did they all cost?

8. 15 gal. 1 qt. 0 pt. 3 gills, are how many gills?

9. How many feet of moulding will be required to go round a room, if it is 35 ft. long and 30 feet wide?

10. Add $\frac{3}{4}$, $4\frac{1}{2}$, $5\frac{2}{5}$, $10\frac{3}{4}$.

11. At \$7.86 a barrel, what will $18\frac{5}{8}$ barrels of flour cost?

How many square inches in each of the following rectangles? Change each dimension to inches before multiplying.

12. 1 ft. 3 in. by 1 ft. 7 in.

13. 4 ft. 11 in. by 5 ft. 8 in.

14. 6 ft. 3 in. by 4 ft. 11 in.

15. 5 ft. 6 in. by 4 ft. 3 in.

16. 9 ft. 7 in. by 8 ft. 9 in.

17. 36 ft. by 23 ft. 5 in. Answer to be in sq. ft.

18. A man deposited in the bank \$30 a month for 10 months, and \$25 a month for the other months of the year. How many dollars did he deposit in the bank during the year?

19. What will $\frac{1}{8}$ of a yard of silk cost at the rate of \$25.60 for 16 yards?

ORAL.

1. If a man can do a piece of work in 15 days, what part of it can he do in one day?

2. If a man can mow a field of grass in 10 hours, what part of it can he mow in 1 hour?

3. If it takes 6 hours for a pipe to empty a cistern, what part of it can be emptied in 1 hour? In 2 hours? In 3 hours?

4. If a family consume a barrel of flour in 40 days, what part of a barrel do they consume daily?

5. If it requires 18 days to perform a journey, what part of it can be performed in 1 day? In 3 days?

6. If A can do a piece of work in 4 days, and B in 2 days, what part of it can each do in a day? What part can both do in a day?

7. If A can mow a field in 4 days, and B can do it in 8 days, what part of it can each do in a day? What part can both do in a day?

8. If A and B can do $\frac{1}{4}$ of a piece of work in a day, how many days will it take them to do the whole work?

9. How many days will it take to do the whole of a piece of work if $\frac{1}{3}$ of it can be done in 1 day?

10. If William can do a piece of work in 3 days and John in 6 days, what part of it can each do in a day? What part can both do in a day? How long will it take them to do it all?

11. B had 4 apples more than A, and together they had 14.

12. Mary has 4 roses more than Martha, and both have 24.

13. Mary gave $\frac{3}{5}$ of all her flowers to Ann, and has 4 remaining. How many did she give away?

14. If the diameter of a plate, is 7 in., what is the circumference?

15. If the diameter of a plate is 14 in., what is the circumference?

16. A lady cut $2\frac{1}{3}$ yards of ribbon from a 10-yard roll.

1. How many pounds of hay can be cut from 12 acres of land that yield 4 tons to the acre?

2. I bought 75 head of horses at $135 each, 85 head of cattle at $62 each, and 275 hogs at $17 each. How much did they all cost?

3. Find the cost of:

63 yd. muslin @ 9¢.
47 yd. cashmere @ 87¢.
62 yd. flannel @ 68¢.
45 yd. velvet @ $1.25.

4. Find the amount of the following articles:

24 tons hard coal @ $5.75.
19 tons soft coal @ $4.12.
46 tons coke @ $2.75.
78 cords wood at $6.80.

5. A bought of B 498 acres of land at $37 an acre, and gave in payment a house worth $2,250, a factory worth 4 times as much, and the rest in money.

6. By selling 13 acres of land for $583, I lose $54. What is the cost an acre?

7. How many tons of coal at $7.50 a ton will pay for 75 thousand feet of lumber at $29 a thousand?

8. 160 pints are how many quarts? Pecks? Bushels?

9. 15 pk. 6 qt. are how many quarts? Pints?

10. Bought a tract of land, and cut it up into 28 building lots, which I sold at $379 each, thereby gaining $1,428. What was the cost of a lot?

11. Mr. Smith bought 19 cows for $532. The cost of feeding them was $7 a head. He sold them for $798. How much did he gain or lose on each cow?

12. What are 7,438 qt. of berries worth at 60¢ a peck?

13. What is the value of 17 lb. 8 oz. of paper at 24¢ a pound?

ORAL.

1. Express as common fractions 10%, 20%, 25%, 50%, $33\frac{1}{3}\%$, $66\frac{2}{3}\%$, 75%, 60%.

2. What is 10% of \$80? \$40? \$100?

3. What is 20% of \$60? \$75? \$100?

4. What is 50% of 12 horses? Of \$60?

5. What is $33\frac{1}{3}\%$ of 18? 24? 30? 60? 90?

6. I bought 2 doz. eggs, but 25% were spoiled. How many were good?

7. A farmer raised 50 bu. of corn, and sold 20% of it.

8. How many gallons of molasses were left in a hogshead, containing 63 gal., after $33\frac{1}{3}\%$ had been sold from it?

9. There are 400 boys and girls in a school. How many are there of each sex if 50% are boys?

10. A man bought a horse, agreeing to pay 25% of the price every month. How many months will it take him to pay the whole bill?

11. A received 20% of \$100, and B received 25% of the same sum. Which received the most, and how much more?

12. What per cent of 80 is 20? Of 20 is 10? Of 40 is 8? Of 60 is 20?

13. 7 is what per cent of 14? Of 28? Of 35? Of 21? Of 70?

14. A boy had 12 cents, and spent 3. What per cent did he spend? What per cent did he have left?

15. A man having \$50, paid \$10 for a coat. What per cent of his money did he spend?

16. If I buy a watch for \$10, and sell it for \$15, how many dollars do I gain? This is what per cent of the cost of the watch?

17. 20 is 10% of what number? 25 is 25% of what number? 50% of what?

18. A man paid \$400 toward a house, and the sum paid was 10% of the sum asked. What was the price of the house?

1. What is the cost of .75 yd. of cloth at $3.25 a yard?

2. Find the cost of 25.5 acres of land at $29.75 an acre.

3. A farmer sold 235.38 acres of land at $28.50 an acre, and took in payment 10 horses at $119.50 each, 28.5 tons of coal at $6.25 a ton, 511.32 cords of wood at $4.25 a cord, and the rest in money. How much money did he receive?

4. A house was bought for $2,475.50. For how much must it be sold to gain $255½?

5. Find the value of 384 acres of land at $9⅜ per acre?

6. If 9 yoke of oxen cost $1,350, what is the cost of 1 yoke?

7. I bought a horse for $125, which is ⅘ of what I sold it for. For what did I sell it?

8. A worked 10 hr. Monday, 11 hr. Tuesday, 9 hr. Wednesday, 8 hr. Thursday, 11 hr. Friday, 11 hr. Saturday. If 10 hr. is considered a day's labor, find out how much A earned during the week at $3.20 a day.

9. A dealer bought 180 horses for $13,680. What must he pay at that rate for 95?

10. If 25 cows cost $1,475, what will 318 cost at the same rate?

11. How many square feet in a walk 250 yd. long, and 6 ft. wide? Square yards?

12. A barn is 62 feet long, and from the eaves to the ridge pole of the roof it is 22 ft. How many square feet are there in both sides of the roof?

13. If a person breathes 18 times a minute, and takes into the lungs 26 cubic inches of air at every breath, how many cubic inches will he breathe in 4 hours?

14. How many cubic feet in a box 72 in. long, 60 in. wide, and 48 in. high?

15. How many rods in 17 miles, 38 rods?

16. How many pints in 47 bu. 3 pk. 2 qt.?

17. How many strokes does a clock strike in 24 hours?

ORAL.

1. 16 is $\frac{2}{3}$ of what number? $\frac{4}{5}$ of what number?

2. 28 is $\frac{4}{5}$ of what number? $\frac{7}{8}$ of what number?

3. 20 is $\frac{2}{3}$ of what number? $\frac{4}{7}$ of what number?

4. 18 is $\frac{2}{3}$ of what number? $\frac{3}{7}$ of what number?

5. If $\frac{1}{5}$ of a ton of coal is worth \$8, what is the price of 2 tons?

6. 9 is $\frac{3}{4}$ of what number? 12 is $\frac{3}{5}$ of what number?

7. At 25¢ a dozen, how many dozen lead pencils can be bought for \$4?

8. How many bushels of pears can be bought for \$5, at 50¢ a bushel?

9. If cloth is 48¢ a yard, what must I pay for $\frac{3}{4}$ of a yard?

10. How many square yards in a square rod?

11. 9 square yards equal how many square feet?

12. How much have I left out of \$8$\frac{3}{4}$ after spending \$6$\frac{1}{4}$?

13. I bought a book for $\frac{7}{11}$ of a dollar, and sold it for $\frac{8}{11}$ of a dollar. Did I gain or lose? and how much?

14. $\frac{1}{2}$ equals how many fourths? How many sixths? Eighths? Tenths?

15. $\frac{1}{3}$ equals how many sixths? How many ninths? Twelfths?

16. At \$$\frac{2}{3}$ a day, what will a boy earn in a week?

17. How many cubic yards of earth were taken out in digging a cellar 10 yd. × 8 yd. × 2 yd.? What did it cost to dig it at 10¢ a cubic yard?

18. \$40 is equal to $\frac{1}{6}$ of my house rent for 1 year. How much do I pay a month?

19. How many sheets of paper are there in a quire? In $\frac{1}{4}$ quire? In $\frac{3}{4}$ quire?

20. How many quires are there in 3 reams? In 5 reams?

21. How many quires are there in $\frac{1}{2}$ a ream? In $\frac{1}{4}$ ream?

22. John earned 30 cents, and his father gave him 20 cents. How many bats at 10¢ each can he buy with all his money?

1. Add four thousand fifty-six; sixty-three thousand seven hundred; nine thousand ninety-nine; six thousand nine hundred seventy-eight.

2. A man bought a farm for $6,450, giving in exchange a house worth $4,500, a note for $1,150, and paying the difference in money.

3. Reduce $63\frac{7}{12}$ and $74\frac{11}{15}$ to improper fractions.

4. Add $33\frac{1}{3}$, $37\frac{1}{2}$, $55\frac{3}{4}$, $66\frac{2}{3}$.

5. From a cask containing $45\frac{1}{2}$ gal. of syrup, a grocer sold one customer $16\frac{3}{4}$ gal., and another $21\frac{5}{8}$ gal. How many gallons remained unsold?

6. If $\frac{4}{15}$ of an acre of land cost $68, what will $12\frac{2}{3}$ acres cost?

7. A man pays $350 a year for house rent. This is $\frac{5}{11}$ of his income. What is his income?

8. A school enrolls 208 boys, and $\frac{4}{5}$ of the pupils are boys. How many pupils are enrolled in the school?

9. What is the sum of $.65, $15.44, $60, 62\frac{1}{2}$, $100, $94.05, 87\frac{1}{2}$.

10. A grocer bought 540 pounds of coffee for $145.80, and 420 lb. of tea for $336. He sold the coffee at 30¢ a pound, and the tea at $1.00 a pound. How much did he gain?

11. How many square feet in the walls of a room 24 ft. by 18 ft., and 10$\frac{1}{2}$ ft. high? What is the area of the ceiling?

12. How many yards of picture moulding will be required for the room in Example 11? and what will it cost at 15¢ a yard?

13. How many square feet in a lot 62$\frac{1}{2}$ ft. by 208 ft.?

14. What is the area of a triangle whose base is 36 in. and altitude 15 in.?

15. If the diameter of a circle is 105 ft., what is its circumference?

16. A flour dealer bought 42 bbl. of flour for $210. He sold $\frac{1}{2}$ of it at $4.75 a barrel, and the remainder at $6 a barrel. How much did he gain?

1. How many cubic feet in the following boxes:
   a. 6 ft. long, 3 ft. wide, and 2 ft. high?
   b. 10 ft. long, 5 ft. wide, and 4 ft. high?
   c. 6 ft. long, 3 ft. wide, and 3 ft. high?
   d. 8 ft. long, 5 ft. wide, and 2 ft. high?
   e. 5 yd. long, 4 yd. wide, and 3 yd. high?
   f. 44 ft. long, $3\frac{1}{2}$ ft. wide, and 7 ft. high?

2. Reduce 12 bu. 5 qt. to pints. Reduce 503 pt. to bushels.

3. If a rectangular field is 84 ft. long and 60 ft. wide, how many boards, each 12 ft. long, will it take to go round it? How many boards to make a fence five boards high?

4. If 13 tons of hay cost \$97.50, what will $7\frac{1}{2}$ tons cost?

5. If 9 men can build a wall in 15 days, how long will it take 5 men to build it?

6. At the rate of 5 peaches for 8 apples, how many apples can be bought for 5 dozen peaches?

7. If $\frac{4}{5}$ of a farm is worth \$4,500, what are $\frac{3}{5}$ of the whole farm worth? What is $\frac{3}{4}$ of it worth?

8. A man buys a rectangular piece of ground 300 ft. long by 150 ft. wide. He builds a house 50 ft. by 30 ft., and a shed 12 ft. by 13 ft. How many square feet of the lot are not covered by the buildings?

9. How many square feet are there in a board fence 10 ft. high round a rectangular lot 250 ft. long, 200 ft. wide?

10. How many acres are there in a rectangular field 80 rd. long, 70 rd. wide? How much is it worth at \$75 an acre?

11. Draw a figure to represent the ceiling and 4 walls of a room 24 ft. long, 18 ft. wide, 12 ft. high. Scale 1 in. to 6 ft. Find the number of square feet in all.

12. Bought a pair of boots for \$4.62$\frac{1}{2}$, an umbrella for \$1.75, a pair gloves for \$.87$\frac{1}{2}$, a necktie for \$1, and some collars for \$.62$\frac{1}{2}$.

13. If 139 bbl. of beef cost \$2,189.25, how much will 1 bbl. cost?